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THE ROLE OF COMBAT HEAVY ENGINEER BATTALIONS IN NATION ASSISTANCE

A thesis presented to the Faculty of the U.S. Army
Command and General Staff College in partial
fulfillment of the requirements for the
degree

MASTER OF MILITARY ART AND SCIENCE



by

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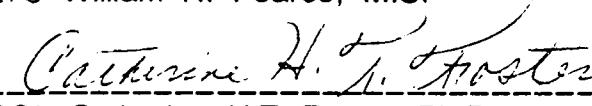
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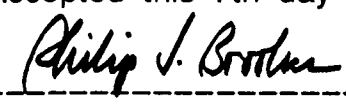
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ABSTRACT

THE ROLE OF COMBAT HEAVY ENGINEER BATTALIONS IN NATION ASSISTANCE by MAJ Allen C. Estes, USA, 136 pages.

This study establishes guidelines for military planners to consider when employing combat heavy engineer battalions on nation assistance projects. The guidelines are based on analyzing the theories of nation assistance, assessing the capabilities and limitations of the combat heavy engineer battalion, and studying lessons learned from nation assistance projects completed in the last decade.

Nation assistance is examined from the standpoint of helping a host nation to become self sufficient by teaching people to help themselves, of countering an insurgency, and of furthering the national interests of both the host nation and the United States. The capabilities and limitations of combat heavy engineer battalions are assessed by looking at the organization, training, personnel, skills, and assigned equipment of these units. The Armed Forces Component System is discussed for use on nation assistance projects. The specific case studies include: AHUAS TARA 89 in Honduras, Dirkou Airfield in Niger, Camino de la Paz 88 in Costa Rica, U.S. Army Corps of Engineer projects in Saudi Arabia, Task Force Rock Eagle in Belize, Operation "No-problem" in Jamaica, civic action teams in Panape, Fuerzas Unidas 89 in Bolivia, and school construction in Bangladesh.

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CHAPTER 1

INTRODUCTION

SECTION 1: DEFINING THE PROBLEM

BACKGROUND

The Army currently has 14 active duty combat heavy engineer battalions located in the United States, Germany, and Korea. The primary specialties in these units are heavy equipment operators, carpenters, plumbers, electricians, masons, mechanics, and truck drivers. Assigned equipment includes dozers, scrapers, backhoes, compactors, compressors, concrete-mobiles, graders, asphalt pavers, bucket loaders, dump trucks, and numerous tool kits and sets.

The primary capability of combat heavy battalions is construction. Combat battalions, on the other hand, are trained for mobility, countermobility, and survivability on the battlefield. Under the proposed E-force concept, combat engineer battalions will be more battle focused, organic to maneuver brigades, and more responsive to the divisions. With anticipated reductions in Army units overall, the need for the combat heavy battalions is being questioned. The Engineer School is currently looking at converting some combat heavy battalions to reserve units and changing the structure of active duty units to provide better support to

installation commanders.¹ Since the Army engineers must avoid competing with civilian labor, good construction training for the combat heavy units in the United States is often difficult to find. As the Soviet threat diminishes and current budgets shrink, the size and composition of the engineer force are being modified to accommodate these changes.

LTG Henry J. Hatch, the current Chief of Engineers, has stated that the engineers must be imaginative and look to new missions to be of greatest service to the nation. He cited examples ranging from developing a new relationship with the Environmental Protection Agency to using engineer assets to help poorer nations develop economically.² The latter mission is the subject of this paper.

The mission of nation assistance has received increased attention and priority throughout the entire Army. Nation assistance is:

political, economic, informational, and military cooperation between the United States and the government of another nation, with the objective of promoting internal development and growth of sustainable institutions within that nation.³

Nation assistance is a complex subject in which the United States Army plays only a supporting role.

The Army is addressing nation assistance primarily as an element of low intensity conflict -- specifically counterinsurgency. The potential role for the U.S. Army as a whole includes training,

advising, and assisting a host nation in the areas of psychological operations, civic affairs, medical support, finance, transportation, communication, literacy, public health education, infrastructure development, and organizational structure. This paper addresses nation assistance only as it applies to one specific Army unit: the combat heavy engineer battalion. Given the equipment, personnel, and capabilities of the combat heavy battalion, its potential role in nation assistance will best focus only on construction skills and infrastructure development.

Army engineer units have recently participated in projects in Latin America, Africa, and Southeast Asia. There is ample historical precedent for Army engineers aiding in a nation's development, including our own. The United States has numerous means besides combat heavy engineer battalions to assist other nations in developing their infrastructure. Examples include providing equipment or money and letting the host nation build a sustainable structure themselves, sending advisors to train and supervise a construction effort, or using U.S. Army Corps of Engineer management assets in conjunction with civilian contractors to do the work. There are certain projects or situations where Army combat heavy engineers will be the best solution. Short-notice responsiveness, low cost, and the willingness to build in hostile or austere environments are often advantages of using Army engineers.

A major wartime mission for combat heavy battalions is sustainment which includes road construction, runway repair, and

base development. Many nation assistance exercises provide superb training for the types of missions that combat heavy battalions will be called upon to perform in time of war. Not only are construction skills tested and developed but a unit is challenged to deploy to a foreign environment, establish a base camp, work closely with a host nation, complete a project under austere conditions often with unfamiliar equipment and materials, coordinate support over long supply lines, and redeploy to home base -- all under a time constraint.

DEFINING THE PROBLEM

Given that the United States is interested in assisting certain nations to develop their infrastructure, and given that the combat heavy engineer battalions are an Army asset with a construction capability, when should these battalions best be used for nation assistance? This thesis answers that question and provide guidelines to assist military planners in determining whether a combat heavy engineer battalion should be used for a particular nation assistance effort.

SECTION 2: THESIS STRUCTURE

SCOPE

This thesis looks at employment of combat heavy battalions in nation assistance from the interests of the United States government, the host nation, and the United States Army. Ideally it would be best to serve the interests of all three all of the time. Unfortunately these interests sometimes conflict. Theories of nation assistance, personal experience serving with a combat heavy battalion, and case histories will provide the basis for the findings.

The analysis begins in Chapter 2 with an examination of nation assistance as a concept with particular emphasis on military involvement. Chapter 3 focuses on the capabilities, structure, organization, strengths and weaknesses of the combat heavy engineer battalion. Chapter 4 takes an in-depth look at specific nation assistance projects completed in the last decade. These include the Corps of Engineer construction in Saudi Arabia, the Dirkou Airfield in Africa, and AHUAS-TARA 89 exercise in Honduras, Camino de la Paz in Costa Rica, and many others. These past efforts help illustrate the types of projects and situations where combat heavy battalions should and should not be employed. Other examples are used whenever an actual project helps illustrate a point. Finally, Chapter 5 contains the recommended guidelines for using combat heavy battalions in nation assistance.

ASSUMPTIONS

1. The United States is interested in nation assistance exercises as a method for improving alliances, enhancing national prestige, and assisting in the development of other countries.

Looking at the National Security Strategy proposed by President Bush, one of the four national interests was "a stable and secure world, fostering political freedom, human rights, and democratic institutions". National objectives that support these interests include:

- support aid, trade, and investment policies that promote economic development and social and political progress

- promote growth of free, democratic political institutions, as the surest guarantee of both human rights and economic and social progress

- aid in combatting threats to democratic institutions from aggression, coercion, insurgencies, subversion, terrorism and illicit drug trafficking.⁴

Nation assistance can play a role in all of these objectives. President Bush further cites foreign assistance as an indispensable means toward nurturing democracy and stability. Foreign assistance supports our security objectives by "strengthening allies

and friends, bolstering regional security, deterring conflict, and securing base rights and access."⁵

2. The United States Army has an interest in nation assistance.

Secretary of Defense Richard Cheney stated in his 1990 Annual Report to the President and the Congress that low intensity conflict continues to be the most likely form of violence involving U.S. interests. He states that the Department of Defense must "address the underlying causes of instability by assisting in the nation building process through economic, security, and humanitarian assistance, and civic action in support of U.S. foreign policy objectives."⁶ While the Army has finite resources and a large number of competing priorities, it appears that significant interest in nation assistance exists.

3. Nation assistance is in the best interest of the developing nation that we are trying to help.

Many of the contributions already made by the United States have been at the request of the host nation. If the legitimate government of the host nation requests United States support, it is assumed that the help is in that nation's best interest.

LIMITATIONS

1. The U.S. Army Engineer School is reviewing the composition and distribution of engineer combat heavy battalions. The force structure of the entire U.S. Army is currently in transition which means the assumptions may become outdated or invalid very quickly. Army policy and doctrine on nation assistance are still being developed.

2. The guidance for the future use of combat heavy battalions is based on national interests and isolated examples from the past. The engineer involvement in nation assistance since Vietnam has been limited so it may be difficult to draw valid conclusions from the small sampling.

3. Most of the information on actual projects was taken from unit after-action reports and periodical articles submitted by the constructing unit. These documents tend to highlight the successes and downplay the problems encountered along the way. Personal interviews with people who had been on the projects offered a more candid appraisal of the difficulties and challenges that had to be overcome.

DELIMITATIONS

1. Only combat heavy engineer battalions are analyzed in this paper. Other units above corps such as pipeline battalions, port construction companies, quarry operations or well drilling units may be attached to a combat heavy battalion for a particular project. Both corps and divisional combat engineer battalions have been excluded from the study. Combat Engineer battalions, which are organized differently, have been used in road construction projects in Latin America but this paper will leave them to their traditional roles of mobility, countermobility, and survivability on the battlefield. Some of the specific projects cited in Chapter 4 were completed by combat battalions. They are included because the lessons learned are equally appropriate for combat heavy battalion projects.

2. No nation assistance efforts prior to World War II were explored because their relevance to the current political situation is questionable. The focus is on nation assistance efforts since the Vietnam War.

3. Industrialized areas of the world have been excluded. Efforts in those areas are probably best accomplished by other sources. For example, the Corps of Engineers is investigating environmental work in Eastern Europe. The use of engineer

battalions in this area at this time was not considered. The combat heavy battalion's ability to help and the Warsaw Pact country's willingness to entertain uniformed American soldiers on their soil are suspect.

4. Construction by combat heavy battalions during medium intensity conflicts, specifically Korea and Vietnam, has been excluded. The Army engineers performed magnificently in Korea and Vietnam especially in the areas of base development and road construction. It can be effectively argued, however, that the construction was in support of our own war effort rather than the development of another nation. Furthermore, the engineers were able to rely on their wartime support structure since elements of the entire Army were in the area. This study has been limited to areas where the construction effort is not in support of our own combat troops. As a result, much of the U.S. nation assistance effort in Panama is not included.

5. Disaster relief has been excluded from this study. It is a valid mission for Army engineers. Disaster relief is an excellent way to offer essential assistance to a nation in trouble and generate good will for our own nation. It does not usually involve the growth of sustainable institutions. Disaster relief has to be responsive and typically affords little time to plan. The suggested guidelines for nation assistance are too restrictive for disaster relief. The United

States will probably not demand as much time to plan nor be as selective toward which countries it helps when there is visible human suffering from a flood, hurricane, or earthquake. It can even be argued that offering a helping hand to a traditional enemy in time of crisis is an inexpensive goodwill measure that can be used as an opportunity to improve relations.

6. The complex and complicated funding aspects of using Army engineers in nation assistance have been excluded. How a project is funded depends on who benefits from the project and how the project gets classified. The problem is difficult to follow and is best explained as a series of "if-then" statements.

If the project benefits the non-combatant indigenous population and not the host nation military, it is classified as humanitarian assistance/civic action. This would include rudimentary transportation systems, well drilling, or sanitation facilities. If the project is part of a joint military training exercise, the funded costs such as fuel and construction materials can be funded under Chapter 20, Title 10, U.S. Code not to exceed \$200,000. The unfunded costs such as military salaries, deployment, depreciation of equipment can be charged to the Operation & Maintenance (O&M) funds allocated for the military exercise.⁷

If the project is to ultimately be used by the United States or to support a joint exercise, the funded costs come from the minor construction account and the unfunded costs come from the O&M

training funds. If the project is to be used by the host nation military, then the project qualifies as security assistance which is funded under the appropriate Foreign Military Sales Account under Title 22, U.S. Code and requires reimbursement of the funded project costs by the host nation.⁸

The problem surfaced during AHUAS TARA II exercise in 1984. U.S. Army engineer units constructed 33 projects at six locations in Honduras which ranged from base camps to airfields as part of a training exercise. The units classified all construction as incidental to troop training and funded the entire exercise with O&M training funds. The General Accounting Office (GAO) audit disagreed. The GAO concluded that the construction was neither temporary nor minor and should have been funded using construction funds which have stricter accounting requirements and different rules for use. Several of the projects were actually civic action/humanitarian assistance projects and should not have used O&M funds.⁹

As a result of the GAO findings, engineer units on joint exercises have been subject to stricter accounting and funding controls. Such restrictions make nation assistance projects more difficult but not impossible to execute. As a result, the funding vagaries have not been considered while developing guidelines for employment of engineers in nation assistance.

SIGNIFICANCE OF THE STUDY

This study will offer useful guidance and suggestions for the future role of combat heavy engineer battalions in nation assistance. The force structure of the engineers is being reviewed and changed. Under E-force, the combat engineers are being reorganized to better support the divisions. The Engineer School is deciding whether certain combat heavy battalions should be moved to the reserves and whether active duty battalions should fall under the post Director of Engineering and Housing (DEH) and work in the respective DEH carpentry, plumbing, and electrical shops for better training. One of the specific missions the Directorate of Combat Developments is examining is nation assistance.¹⁰

The Engineer School is currently drafting FM 5-114, "Engineer Support: Operations Short of War" which specifically addresses the role of engineers in nation assistance as a part of counterinsurgency operations. The Concepts and Force Alternatives Directorate at Fort Leavenworth is coordinating the third draft of "Airland Battle - Future Nation Assistance Concept". Nation assistance is a high priority topic among engineers and throughout the Army. Since no policy has been resolved concerning either nation assistance or the future role of combat heavy engineer battalions, this study will contribute to the debate and may help influence the outcome. In addition, this thesis is one of the few documents that

attempts to categorize the efforts of the U.S. Army engineers in nation assistance over the last decade.

SECTION 3: REVIEW OF THE LITERATURE

Most of the available literature on nation assistance theory -- essentially individual's ideas on how it should best be conducted -- comes from either the 1960s or the last six years. During the Kennedy administration and the Alliance for Progress, a number of initiatives both in and out of the military community were developed for helping poorer countries. A number of writings and projects followed. The more recent nation assistance sources come primarily from theses and papers written by other military officers which propose a role for the Army or the engineers in nation assistance.

The most useful source for advocating nation assistance as a means to help people help themselves was Promoting Civic Action in Less Developed Nations: A Conceptualization of the U.S. Military Role by Alfred Kraemer. Nation Building Contributions of the Army was written soon after and was based upon Kraemer's study. The draft versions of the Army doctrinal manuals cited in the previous section were the principal sources for nation assistance as a means for low intensity conflict.

The remaining theory came mostly from dissertations and theses written by military officers at the Army War College,

Command and General Staff College, and the Air War College. These theses focused on nation assistance at the strategic level, mostly from the viewpoint of counterinsurgency or furthering U.S. interests. While these documents highlighted some of the potential pitfalls of nation assistance, the authors all appeared to have a bias which favored using engineer assets for nation assistance.

The primary sources for describing the capability, structure, and limitations for the combat heavy engineer battalion were the Tables of Organization and Equipment (TOE) and Engineer field manuals. FM 5-100 Engineer Combat Operations was helpful in describing the roles and missions of all Army engineer battalions. The author's personal experience was the source for most of the analysis on the capabilities and limitations of the combat heavy battalion. The Engineer magazine article, "AFCS: A Flexible Template for Base Camp Design", provided an excellent description of the Army Functional Component System.

During the late 1960's and through the 1970's the focus of foreign involvement, especially with the Army engineers, was in Vietnam. There are few useful sources for this paper written during this time period. The concept of using engineer soldiers for nation assistance remained dormant until the mid 1980's when U.S. Southern Command (SOUTHCOM) sought U.S. engineer assistance in Latin America. Starting with the first AHUAS TARA exercise in Honduras in 1983 and the first reserve engineer exercise MINUTEMAN I in Panama in 1984, the success of these efforts forged

a policy that has caused nation assistance in Latin America to continually expand.¹¹

Most of the information on the specific nation assistance projects come from magazine articles and after action reports from engineer construction in Latin America. Both Active Duty and Reserve units performed construction missions in Honduras, Costa Rica, Belize, and Panama in an effort to develop their infrastructure, improve their economies, and develop the SOUTHCOM theatre.

The unit after action reports provided minute details of every aspect of a particular construction project. They covered everything from how often soldiers received mail to the location of the latrines in the base camp. The after action reports offered numerous recommendations for improvement at the unit level and are excellent sources for any engineer unit planning to deploy on a nation assistance project. The after action reports typically contained no information about how that particular project fit into the U.S. strategy for the host nation or how it related to other projects in the region. With the exception of the Dirkou Airfield project, the after action reports were very positive and highlighted the success of the projects.

The most useful periodicals were Engineer and Military Review. Engineer articles offered the engineer strategy for nation assistance and reported the details of specific projects. The tone of these articles was overwhelmingly in favor of using engineers

for nation assistance efforts and tended to focus on engineer capabilities. The articles on specific projects tended to summarize the details of the construction but not to the level of detail as the after action reports. The articles tended to look at a specific project by itself rather than in conjunction with other nation assistance efforts. The Military Review articles examined nation assistance from a strategic viewpoint and were more balanced in their assessment of using Army engineers for nation assistance.

As the war on drugs has received greater priority, engineers have looked at nation assistance as a means to help stop the flow of drugs and create alternative markets. Two Command and General Staff College theses, U.S. Military Nation-Building in Peru -- A Question of National Interest and Can U.S. Army Engineer Units Assist Host Nation Coca Eradication Efforts in the Andean-Amazon Region?, were the primary sources for using nation assistance in the drug war. Both sources listed the drawbacks but concluded that Army engineers have a meaningful role.

The engineers have also been at work to a lesser extent in the Middle East, Africa, and Southeast Asia. Limited information was available on these projects, mostly from after action reports, magazine articles, and personal interviews. The collection of after action reports was difficult since no single agency has a complete set. The Directorate of Evaluation and Standardization at the U.S. Army Engineer School had a reasonable assortment. There were no

documents that compared, contrasted, or discussed the aspects of more than one project.

SECTION 4: RESEARCH METHODOLOGY

The conclusions and recommended guidelines are based on three sources: literature on the principles of nation assistance, personal experience from serving in a combat heavy engineer battalion, and from case histories of actual projects. The methodology for obtaining these guidelines began with reading the literature and reducing the various concepts of nation assistance into several general categories. The nation assistance concepts were synthesized and categorized into: helping people help themselves, counterinsurgency, and furthering the interests of both countries -- all of which are described in detail in Chapter 2. Each theory was analyzed based on the desirability of employing combat heavy engineer battalions. A nation assistance effort was desirable if it met the objectives of the individual nation assistance theory.

Next desirability was examined independent of an individual theory such as if a project provided good training for the unit, was of suitable duration, and allowed sufficient time to properly plan. The aspect of acceptability was considered in terms of the awareness of risks and the potentially adverse consequences of nation assistance projects. The pitfalls and dangers of nation assistance were identified such as offering support to an

illegitimate government, providing structures that cannot be maintained, or promising a host nation more than we can reasonably provide.

A project was defined as feasible if it was within the capability of the combat heavy engineer battalion to successfully complete it. Engineer field manuals and personal experience were used to describe and analyze the organization and equipment of the combat heavy engineer battalion and then to assess the capability of these battalions. Finally, the lessons learned from actual projects were used to recommend how combat heavy engineers should be employed in the future. The lessons from the case studies along with the desirability, acceptability, and feasibility criteria were analyzed and synthesized to create a set of guidelines to be used by planners for using combat heavy engineer battalions in nation assistance.

ENDNOTES

¹ Joseph Searly, Interview by author at Fort Leonard Wood, 19 October 1990.

² Henry J. Hatch, "Beyond the Battlefield -- The Other Dimension of Military Service," Engineer 20, no. 2 (July 1990) 17-19.

³ U.S. Army, "FM 5-114: Operations Short of War", Draft Version, (Fort Leonard Wood: U.S. Army Engineer Center, 1990).

⁴ The White House, National Security Strategy of the United States, (Washington D.C.: U.S. Government Printing Office, March 1990) 2-3.

⁵ Ibid., 18.

⁶ Department of Defense, Annual Report to the President and the Congress, (Washington D.C.: U.S. Government Printing Office, 1990) 3.

⁷ D. D. Gransberg, Funding Engineer Operations in Countries Involved in Low Intensity Conflicts, (Maxwell AFB: Air Command and Staff College, 1988) 16.

⁸ Ibid., 28.

⁹ Ibid., 16.

¹⁰ Searly, interview, 19 October 1990.

¹¹ Clinton W. Willer, "Perspectives on Nationbuilding in Low Intensity/High Probability Conflicts: Engineer Challenges", Military Review LXIX, no. 2 (February 1989) 30.

CHAPTER 2

A CONCEPT OF NATION ASSISTANCE

INTRODUCTION

While nation assistance was defined in Chapter 1, there are numerous viewpoints on how it should be applied. The opinions range from nation assistance as a benevolent means to promote economic development in a poorer country, to nation assistance as a form of counterinsurgency, to nation assistance as an inexpensive means of furthering U.S. interests in a region. The potential role of combat heavy engineer battalions varies with which viewpoint is adopted.

HELPING PEOPLE HELP THEMSELVES

Nation assistance in its purest, most altruistic form is designed to help a developing nation to help itself. It includes assisting in the development of social and psychological features which will foster economic development -- specifically in the areas of organization, values, attitudes, motivation, knowledge, and skills. For long term socio-economic development, the host nation must engage in long range, sustained activities that will develop their abilities. The United States should provide training, capital, and

technology but the focus must be on helping the host nation develop themselves.¹

In this context, all nation assistance projects should be evaluated on their suitability for developing the people rather than a specific need the project is intended to meet.² The ultimate measure of success is freedom from United States aid and the development of a self-supporting economy that can compete and function by itself.³ The most tangible benefits to the United States of assisting the development of a fledgling nation are generating goodwill and fostering an alliance. Many U.S. citizens believe it is the obligation of a richer nation to help a poorer one assuming the poorer nation desires the assistance. The United States should consider all assistance from the viewpoint of the people they are attempting to help.

From this restrictive view of nation assistance, the role of combat heavy battalions is minor. The Army as an organization excels at training, operates numerous schools, and teaches hundreds of skills. If the focus is on training, supervising, and advising the host nation population, the Army has assets which are better suited for training host nation personnel than are combat heavy battalions. The Army's Mobile Training Teams (MTT) are a better option. These small teams, averaging 10-20 members consisting of medical, civil affairs, engineer, and special forces personnel, are designed to train and advise. The members are usually officers or non-commissioned officers. Most members of the combat heavy engineer battalions are

enlisted and in need of training themselves. The combat heavy battalions are best used when they are given a construction mission and are allowed to perform it themselves.

Suppose a village needs a new school. Under the concept of teaching people to help themselves, employing a combat heavy battalion to build the school denies the local population valuable development opportunities. The U.S. Army would provide the village with a useful structure that they did not have before and the village would most likely be grateful for the American effort. But the villagers would be no better able to help themselves.

If the villagers had been trained and had helped to build the school themselves, they would have benefitted more. The village would have been forced to organize itself for a community project and develop communication and support channels that could be used on future projects. They would have had to coordinate with their own local government agencies such as the Ministry of Education, Public Works Department and government leaders. The village would develop sources of supply and methods of procurement. Upon completion, the villagers would have a tremendous sense of accomplishment and would have developed valuable construction skills that could be used later and passed on to others. The terrific training benefits that the combat heavy battalion would ordinarily receive would be achieved by the local population. If unemployment is high in the village, there is even less reason to use combat heavy battalions to perform the construction.⁴ Under this restrictive

definition of nation assistance, are there any possible circumstances when combat heavy units should be used?

It is more efficient, quicker, and cheaper to let the combat heavy battalion build the school. It will take more time and effort to teach the community rather than doing the job for them. If funds are limited and the approving authority for these funds wants to see quick results, the construction units can do it faster and for less money. Future funding and approval may be dependent on the current progress of a program. Progress is usually measured in number of facilities constructed. If schools could be constructed in three villages by combat heavy battalions for the same price and time that it would take to teach one village to build their own, the best solution is harder to assess. Furthermore, if the project is a critical facility such as a hospital that is needed right away, it might be best to let the combat heavy battalion provide the facility in less time despite the loss of training benefit to the population. The effect is also mitigated if members of the local population can be trained to maintain the structure during construction. Similarly, the value of teaching a nation to help itself may be weighed against the superb training value of sending a combat heavy unit into a foreign country for a construction mission. In general, the combat heavy battalions have a limited role when the goal is to train people to help themselves but there are exceptions, even under this theory, where the use of combat heavy battalions would be an effective solution.

NATION ASSISTANCE AS COUNTERINSURGENCY

Another view of nation assistance is as a means of low intensity conflict, specifically counterinsurgency. Nation assistance is a low cost, low risk means to offer support to a friendly government that is experiencing instability from forces outside the government. An insurgency survives and grows by turning the population against the existing government. Nation assistance is designed to help the host nation government provide infrastructure and services that will benefit the population.

Once the United States decides that it wants to get involved in helping to fight an insurgency, there are several available options. Diplomacy is the easiest and cheapest means but its effectiveness is often limited. Covert action is often effective and not overly expensive but can be both risky and unpopular with the American people and the host nation. Direct military action is an expensive last resort and usually indicates that all other means have failed. Nation assistance is inexpensive, popular, and its true effectiveness has never been measured. The objective is to stop an insurgency by relieving dissatisfaction before popular support for the insurgents has a chance to fully develop.⁵

There are many reasons why an insurgency may be successful and the United States should look at these prior to offering help. Populations may have unfulfilled expectations due to

unsatisfactory economic and social development and naturally blame the government. There may be a perceived unfair distribution of land, wealth, or opportunity. The dissatisfaction may be the result of suppression of social, ethnic, or religious groups. There may be a foreign presence (such as the United States) where the government is seen by the local population as a puppet. An external war or threat from outside the country may be causing hardship at home. The host nation government may be highly oppressive and totally intolerant of any opposition. The insurgency may be providing an alternative ideology or leadership outside the scope of government.⁶

Common characteristics among nations most susceptible to insurgency include population growth that is greater than economic growth, rural populations separated from the nation's political life, and an economy dependent on one or two raw materials. A gap often exists between a small ruling elite and the remainder of the population. The country is often characterized by vast areas of undeveloped land, inadequate industrial and transportation infrastructure, and poor water supply and sanitation. These countries are often faced with rugged geography, limited resources, low per capita income, and frustrated population expectations.⁷

A number of the problems listed above, especially the transportation, sanitation, water supply, and limited infrastructure problems, are within the capability of the combat heavy battalions to lend assistance. Before helping, the United States must assess the cause of the insurgency we are trying to help defeat. By

offering assistance, the United States is supporting the existing government. If the U.S. acknowledges that the host nation government is the legitimate voice of the people but that government is prevented from offering services to the population solely because of resource constraints, it would probably be desirable to help. If the government is repressive and inhumane to its population, offering support may bring guilt by association and resentment from a future government which is more acceptable to the local population. Recent examples include the Shah in Iran, Somoza in Nicaragua, and Noriega in Panama. If the government is viewed as a United States puppet, then offering assistance may only exacerbate the problem and fuel the insurgency.

An example of a dilemma is the Philippines. The Philippines face overwhelming poverty, staggering foreign debt, dependence on a few commodities, and a lack of transportation, sanitation, and communication throughout the islands. The U.S. has military forces stationed at Clark Air Base and Subic Bay. The Philippines belonged to the United States from the Treaty of Paris in 1898 through 1934 when the U.S. Congress established the Philippine Commonwealth. The Philippine constitutional system is modeled after the United States.⁸ On the surface, the Philippines seem a logical location for conducting nation assistance using combat heavy battalions working alongside the Philippine Army -- especially since the Philippines have been fighting a Communist insurgency for 21 years.⁹

The primary goal of the Communist Party of the Philippines (CPP) and the New People's Army (NPA) is basic land reform. Most of the cultivable land is owned by a few wealthy families who have strong ties to the government. Ninety-six percent of the wealth is controlled by four percent of the population. Many of the local governments are corrupt and the Army has conducted brutal search and destroy missions through the civilian population. Several attempted coups attest to the disagreement between the government of President Corazon Aquino and the military.¹⁰

Since the insurgency's demands are for basic fairness and human rights from the government, the U.S. should be cautious. Sending combat heavy battalions into the Philippines for nation assistance would demonstrate to the Philippine people that the United States supports and aligns itself with a government and a military that unquestionably need reform. The decisions are not always easy.

A battalion commander certainly will not make this determination and hopefully no military officials will make it by themselves. Because of the potentially sensitive nature of nation assistance projects, the State and Defense departments must be in concert on even the small ones. Operations should be supported by a national plan formed in conjunction with the host nation government, the theatre strategy of the regional military commander-in-chief (CINC), and the global strategy of the National Security Council. Only then can it be adequately determined whether

our assistance is being extended toward a nation we want to support and whether our project will help meet our objectives.⁸

Nevertheless, if the goal of nation assistance is to counter an insurgency that is caused by rising dissatisfaction among the population, and if part of that dissatisfaction can be relieved by improved infrastructure, and if the United States determines that the existing government is one we want to support, then the combat heavy engineer battalions have a potentially valuable role in nation assistance.

FURTHERING THE INTERESTS OF BOTH COUNTRIES

Another view of nation assistance is one which balances the interests of the host nation with those of the United States. This view seeks to improve the economic development of another country while at the same time furthering our own interests by promoting democracy, influencing change, and developing goodwill that can in the future help our own economy, foster an alliance, and improve our own sphere of influence. In this context, nation assistance becomes less restrictive and increases the potential use of combat heavy engineer battalions. It recognizes that all alliances must be mutually beneficial.

With this objective, a valid nation assistance mission would be the construction of an airfield for a host nation to improve its transportation network and its ability to move goods to market. The

United States might view the airfield as a potential landing or basing area in support of a future contingency plan in the region. Somalia, for example, has granted the U.S. access to bases in Mogadiscio and Berbera in exchange for aid to its refugees. Kenya recently offered basing rights in Mombassa and the U.S. has provided Kenya with F-5E aircraft.¹² The bases in both Kenya and Somalia would be valuable in a conflict in the volatile Middle East.

Nation assistance can be used in the same type of mutually beneficial arrangement. The roads in Jordan and the military bases in Saudi Arabia that the U.S. constructed were neither humanitarian gestures nor counterinsurgency operations. They were nation assistance efforts designed to improve our relations with moderate Arab nations in an unstable area that controls a disproportionate share of the world's oil supply. The U.S. can use nation assistance to provide something of value to a host nation with the goal of getting something in return that will further U.S. interests. If the political situation is appropriate and the project is suitable, then combat heavy battalions could play a valuable role in this form of nation assistance.

COORDINATION OF EFFORT

Regardless of what theory of nation assistance is accepted, United States efforts are properly controlled by the ambassador acting through inter-agency country teams. The supporting agencies

may include the Military Assistance Advisory Group (MAAG), Central Intelligence Agency (CIA), Security Assistance Organization (SAO), Drug Enforcement Agency (DEA), United States Information Service (USIS), the United States Agency for International Development (USAID), and many others. While all players need to be involved, a dual chain of command hinders coordination and communication. The ambassador is working through regional secretaries and ultimately the Secretary of State while the regional CINCs are working through the Joint Chiefs of Staff and the Secretary of Defense. Still, the coordination is essential to produce a coherent and consistent nation assistance policy toward any given country.¹³ There can be no standard program since every country and every ally is different.

The U.S. can inadvertently encounter unforeseen pitfalls that result in unintended consequences with nation assistance. Full cooperation and consultation between the military and the country team may avert some embarrassing oversights. For example, American practices may offend the cultural norms or religious beliefs of the host nation. The project may deny jobs to a host nation with high unemployment. An effort to open roads for farmers to get their produce to market may be helping drug producers to do the same thing. The project may be too complex for the host nation to sustain which would generate frustration rather than goodwill. The nation assistance effort may be threatening to one of the host nation's neighbors which may erode regional stability. Somalia, for example, claims territory in areas of northern Kenya. A project in

the disputed area for either Somalia or Kenya would clearly offend the other.¹⁴ The chances for these types of mistakes diminish when U.S. representatives from various agencies talk to each other.

EMPLOYMENT OF COMBAT HEAVY BATTALIONS

Once it is determined -- by whichever view of nation assistance the government accepts -- that a particular project is in the best interest of both the host nation and the United States, the next question is who should conduct it. The options include host nation civilians with minimal U.S. support, U.S. civilian contractors, Army Corps of Engineer management with a combination of contractors, the host nation military, U.S. Army combat heavy engineer battalions, or a combination of the above. It clearly depends on the technical nature of the project, the host nation capability, the size and scope of the project, the funding available, the political climate of the host nation, the U.S. objectives in the project, the host nation objectives, and the safety of the work environment.

The combat heavy battalions have limitations in equipment, training, and technical expertise which will be discussed in the next chapter. If the project is too large or too technical, other means such as U.S. contractors or civilian Corps of Engineer assets should be considered. Civilian contractors are expensive. If funding is sparse, the combat heavy battalion is far less expensive. Combat

heavy battalions might still be used if a project could be simplified or if the unit could be supplemented with the necessary additional assets.

If the host nation was fully capable of doing a project itself, it would not need or probably even want U.S. assistance. Depending on what support the host nation requires, an analysis must evaluate the available options. If the host nation is experiencing high unemployment and needs only a few pieces of construction equipment to complete the project, the host nation is probably best served by doing the project itself. If the host nation military is already actively involved in developing the nation's infrastructure and simply lacks the labor and equipment to complete everything that is necessary, then support from a combat heavy battalion is probably warranted.

There are an infinite number of possibilities that fall somewhere in between. If the project can be completed by host nation personnel with significant outside training and support, yet the project would be a great training mission for combat heavy battalions, then the situation is less clear. A decision would have to consider materials available, host nation desires, availability of U.S. personnel, desired duration of the project, and U.S. objectives in the region.

The political climate of the host nation may preclude the use of uniformed United States soldiers for any project. In light of events in Eastern Europe, the United States may desire to offer

nation assistance to former Warsaw Pact countries. No matter how desirable the project, it will take considerable time before it would be politically acceptable to send an Army engineer unit into Eastern Europe.

The military is a powerful institution in many countries and is not always in concert with the legitimate government. In many countries, the military is brutal and totally feared by the local population. Any American military unit that attempts a nation assistance project will undoubtedly be working with the host nation military. The U.S. would be offering public support for the host nation military which may or may not suit U.S. national interests. If the U.S. does not approve of the host nation military, a combat heavy battalion is probably not a good resource for a nation assistance project.

If the host nation's military is already involved in nation assistance missions, there is an excellent opportunity to support it with U.S. combat heavy battalions. U.S. assistance may improve relations and provide opportunities for combined training with the host nation military. Valuable liaison and opportunities for sharing information would be exchanged that might be valuable at a later date. If the government and the military are already serving the people, especially if the projects are non-military in nature, U.S. support is easier to justify.¹⁵

The United States Army was responsible for much of the early development of the United States and the opening of the West.

There are numerous examples where other nations' soldiers are performing the same function. In South America, for example, the militaries of Brazil, Chile, Colombia, Guatemala, and Peru are actively involved in the development of their nation's infrastructure. Brazil has two Army Engineer Groups fully engaged in road and rail construction. Other Army engineer units developing their own nations include Indonesia, Thailand, Senegal, Honduras, and Malaysia.¹⁶ The role of the combat heavy battalion is more obvious and support for a project easier to justify when the host nation military is already involved in building their infrastructure .

If the host nation military is not already involved in nation assistance, they should be given at least a supporting role in any combat heavy battalion project. The host nation military can best advise U.S. units on local customs, provide security, help with language difficulties, and provide local expertise. By including the host nation military and the local government as much as possible, the project is better viewed as a joint effort between the host nation and the United States. The host nation government, rather than an outside power, is given credit for providing services to the people.

Nation assistance projects often take place over rough terrain in a remote, hazardous environment. In many cases, security is required and a civilian contractor would either be unwilling or would require an exorbitant sum to participate. The combat heavy battalions are likely candidates for these projects especially if the

host nation military provides the security. General Paul Gorman while he was commander of U.S. Southern Command (SOUTHCOM) stated:

There is surprising recognition in the Third World of the value of military engineer units with the equipment and discipline to undertake construction tasks in remote areas where security may be questionable or in a neutral disaster zone where operation by commercial contractors is unlikely.¹⁷

Since the existence of combat heavy engineer battalions is predicated on constructing in time of war, a hazardous environment would be an overwhelming consideration for their use in nation assistance.

The combat heavy battalions are just one asset available for nation assistance projects. Whether the primary objective of nation assistance is to teach a nation to help itself, to defeat an insurgency, or to further the best interests of both countries, it will affect how and when they are best employed. The desirability, feasibility, and acceptability of using combat heavy battalions depend on the type of project, availability of other means, political climate, host nation desires, U.S. objectives, and the hazardous nature of the project.

ENDNOTES

¹ Alfred J. Kraemer, Promoting Civic Action in Less Developed Nations: A Conceptualization of the U.S. Military Role, Technical Report 68-10, (Washington D.C.: Human Resources Research Office, George Washington University, 1968) 7.

² Ibid., 8.

³ Thomas B. Lindahl, Counter-Revolutionary Warfare: Strategy Considerations, (Maxwell AFB: Air Command and Staff College, 1986) 10.

⁴ Kraemer, 9.

⁵ Albert R. Colan Jr., Military Civic Action in a Counterinsurgency Strategy: An Engineer Proposal. (Carlisle Barracks: U.S. Army War College, 1985) 4.

⁶ Lindahl, 10-12.

⁷ John E. Schaufelberger, "Engineers Build Stability in Troubled Regions," Engineer 17, no. 4 (March 1988): 8-9.

⁸ P552: Insurgency and Counterinsurgency, (Fort Leavenworth: Command and General Staff College, January 1991), 93-95.

⁹ Edgar O'Ballance, "The Communist New People's Army," Military Review LXVIII, no. 2 (February 1988) 12.

¹⁰ P552: Insurgency and Counterinsurgency, 94-96.

¹¹ Steven Metz, "Airland Battle and Counterinsurgency," Military Review LXX, no.1 (January 1990) 35.

¹²P517 Operational Warfighting, (Fort Leavenworth: Command and General Staff College, January 1991), 35, 39.

¹³Metz, 35.

¹⁴P517 Operational Warfighting, 35.

¹⁵Colan, 5.

¹⁶Department of the Army, International and Civil Affairs Directorate, Nation Building Contributions of the Army (NABUCA), (Washington D.C.: U.S. Government Printing Office, 1968) Appendix D, D11-D20 and D46-D64.

¹⁷Colan, 15.

CHAPTER 3

THE COMBAT HEAVY ENGINEER BATTALION

INTRODUCTION

Since the focus of this paper is the employment of combat heavy engineer battalions in nation assistance, this chapter examines the unit's structure, organization, capabilities, equipment, and limitations. While the Army has several types of engineer troop units, the combat heavy battalions are specifically tailored for construction missions. One way to examine the capabilities of the organization is to look at the types of projects that combat heavy battalions have completed in the past. This chapter also examines the potential training benefit derived from nation assistance. Understanding the strengths, weaknesses, and support requirements of a combat heavy battalion is necessary when evaluating the battalion for a nation assistance project.

ARMY ENGINEER BATTALIONS

The U.S. Army engineer battalions can best be divided into divisional combat battalions, corps combat battalions, combat heavy battalions, and topographic battalions. The divisional combat

battalions, as their name indicates, are organic to a specific combat division. They perform mobility, countermobility, and survivability missions at the forward edge of the battlefield. The corps combat battalions which can be further classified as wheeled, mechanized, or light, reinforce the divisional battalions. The corps battalions are usually found performing mobility, countermobility, and survivability missions specifically in the forward brigade areas, division rear area, and in the corps area of the battlefield. The topographic battalions specialize in surveying, terrain analysis, and map reproduction.¹

The bulk of the engineer construction capability in a theatre of operations is in the combat heavy battalions which are found in corps and theatre level engineer brigades. They play a vital role in the sustainment of the corps area and *communications zone*. During wartime, combat heavy engineers will be building roads, railways, pipelines, bridges, airfields, ports, buildings, utilities, and enemy prisoner of war camps.² In the offense, combat heavy engineer battalions replace assault and tactical bridging with semi-permanent fixed bridging, remove obstacles, maintain roads, construct support facilities, and repair runways.³ The defense missions typically include airfield construction and repair, construction of support and repair facilities, and the maintenance of lines of communications.⁴

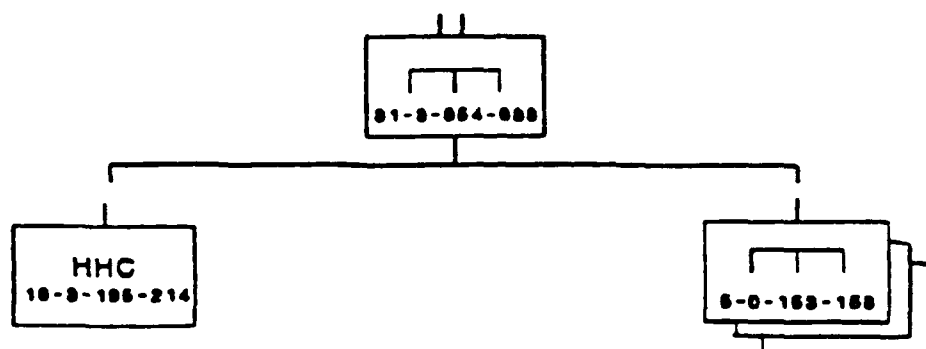
While the corps and divisional combat battalions have conducted a number of nation assistance exercises, the combat

heavy battalions are best suited, both in personnel and equipment, to perform construction missions. The combat battalions are equipped with heavily armored tracked vehicles designed for protection on the battlefield while the combat heavy battalions have scrapers, dozers, cranes and graders designed for construction in a more secure environment. Most soldiers in the combat battalions have the Military Occupancy Specialty (MOS) designation 12B: Combat Engineer. They train on the same basic tasks as the infantryman and specialize on those engineer skills such as minefield emplacement, demolitions, obstacle removal, and tactical bridging.⁵ They are trained to fight violently and move rapidly on the battlefield. The combat heavy battalion soldiers possess MOS designations in the 51 and 62 career fields which include carpenters, masons, plumbers, electricians, and heavy equipment operators.

THE COMBAT HEAVY ENGINEER BATTALION ORGANIZATION

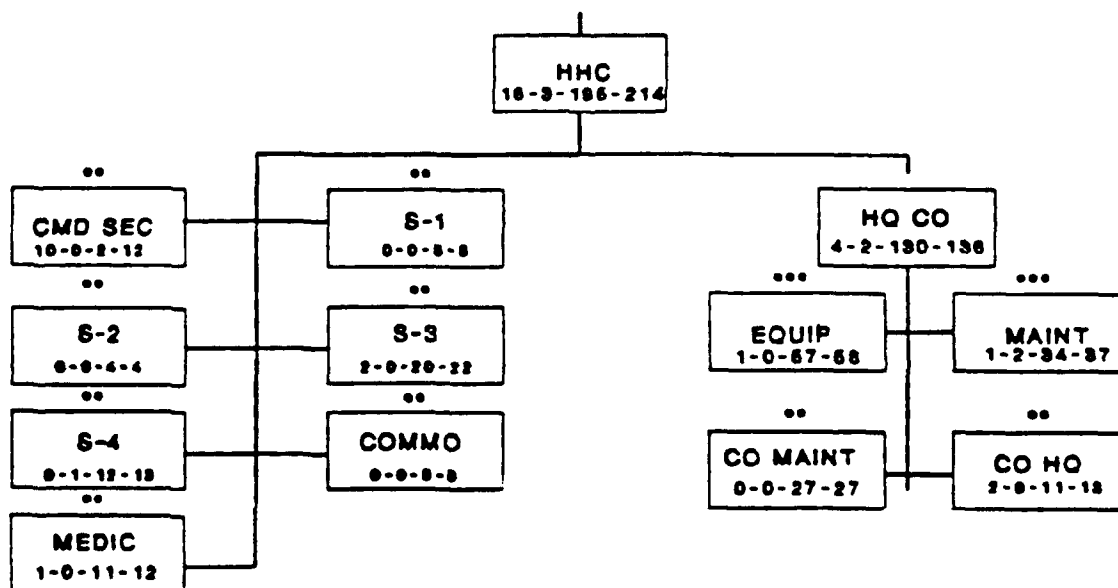
The combat heavy battalion consists of a headquarters and headquarters company (HHC) and three line companies (Figure 1). Some combat heavy engineer battalions have two line companies, with the third company as a roundout unit in the reserves. A battalion staff, company headquarters, equipment platoon, and a maintenance platoon comprise the HHC (Figure 2). The battalion staff includes the commander; principal staff officers for administration, operations, and supply; a communications section;

FIGURE 1. COMBAT HEAVY ENGINEER BATTALION



and a medical aid station. The battalion staff has twelve officers assigned -- roughly 40 percent of the officers in the battalion. The headquarters company's equipment platoon has mostly low density construction equipment that is not used often enough or not authorized in sufficient quantity to justify assignment to a line

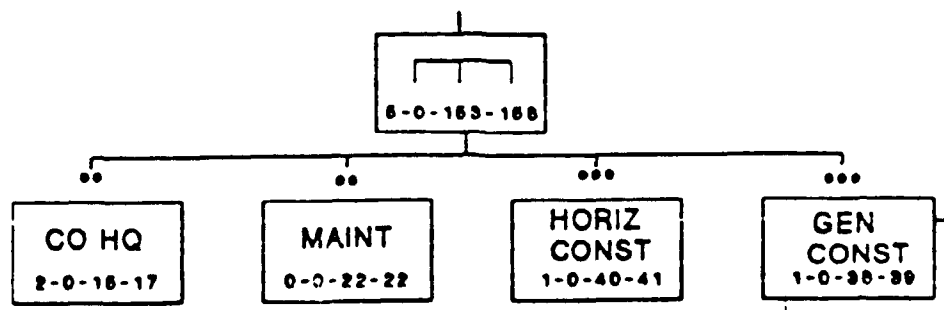
FIGURE 2. HHC, COMBAT HEAVY ENGINEER BATTALION



company. Examples include 20-ton dump trucks, asphalt equipment, 5-cubic yard loader, 20-ton crane, concrete mixers, a sweeper, and fork lifts. Because the engineer equipment is unfamiliar to the ordnance units which typically perform direct support maintenance, the HHC maintenance platoon performs direct support level maintenance for the battalion's engineer equipment.⁶

The three line companies (Figure 3) have a company headquarters, a unit level maintenance section, a horizontal construction platoon, and two vertical construction platoons. Each line company has five officers: a commander, executive officer/construction officer, and three platoon leaders. The three platoons of the line companies perform the bulk of the combat heavy battalion's construction. Everything else in the battalion supports the efforts of these construction platoons. Unless the project is

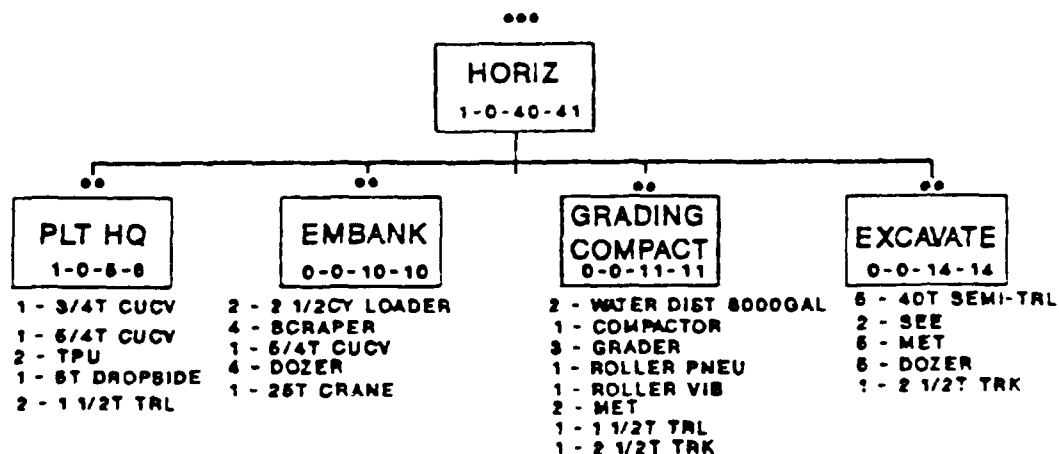
FIGURE 3. ENGINEER COMPANY, COMBAT HEAVY ENGR. BATTALION



miniscule, the platoon is the smallest unit that would most likely be employed on a nation assistance effort. The platoon leader is the lowest level at which project scheduling, material coordination, and construction management can effectively be performed.⁷

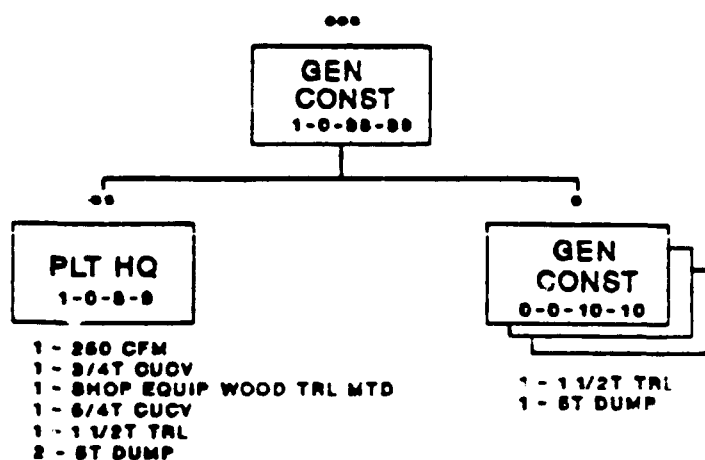
The horizontal construction platoon (Figure 4) has the preponderance of a line company's heavy equipment. The platoon is divided into a headquarters element and three squads which specialize in embankment, grading/compacting, and excavation respectively. The horizontal platoon specializes in earthmoving projects such as building roads, airfields, and vehicle hardstands. Platoon equipment includes dozers, loaders, scrapers, water distributors, various rollers and vibrators, graders, backhoes, and a crane.⁸

FIGURE 4. HORIZONTAL PLATOON, COMBAT HEAVY ENGR. BATTALION



The general construction platoon (Figure 5) specializes in vertical structures and is divided into a headquarters element and three general construction squads. The 5-ton dump truck is the primary means of transportation. The major pieces of assigned equipment are an air compressor, a shop trailer, and numerous tool kits and sets to support the plumbers, carpenters, electricians, and masons.⁹

FIGURE 5. GENERAL CONSTRUCTION PLATOON, COMBAT HVY. ENGR. BN.



Overall, the combat heavy battalion is assigned 31 officers, 3 warrant officers, and 654 enlisted and non-commissioned officers.¹⁰ An individual construction platoon will consist of one officer, one E-7 (Sergeant First Class) platoon sergeant, three E-6 (Staff Sergeant) squad leaders, and approximately 35 soldiers in the grade E-5 (Sergeant) or below (Specialists and Privates). The majority of the soldiers are on their first enlistment and report to

the unit after Advanced Individual Training (AIT) in their respective specialties. The Army provides these soldiers with several months of training in a school environment and expects the unit to provide additional training and practical experience.

A typical assignment lasts three years. Consequently, one-third of the unit rotates annually. The combat heavy battalion, like any other Army troop unit, is in a constant state of training. At any point in time, the experience level of the unit will not be very high. There are many first term enlisted soldiers relative to the number of officers and non-commissioned officers who provide guidance and leadership. As a result, the combat heavy battalions are well suited to complete construction projects themselves but are not a good resource for training and supervising local host nation personnel.

CAPABILITIES OF THE COMBAT HEAVY BATTALION

Given the experience level of the engineer soldiers, projects must be limited in their degree of technical sophistication. The general construction platoons do very well building single-story, wood frame or masonry block structures. A ten-story, structural steel building would exceed the expertise of the soldiers and the capability of organic equipment. Standard interior electrical wiring and plumbing are well within the unit's capability but a complex heating/air conditioning system or an elevator are not. Complicated

mechanical or electrical equipment is best installed by other sources.

Despite their construction specialties, combat heavy engineers have been through basic training, qualify annually on the M-16 rifle, and train for three months a year on combat engineering skills. Their wartime mission is construction in a hostile environment -- something a civilian construction worker is not trained for. If hostilities are expected, the engineers are more productive if augmented with a security force. Nevertheless, if the nation assistance project takes place in a hazardous environment, the soldier skills of combat heavy engineers should be considered.

The maximum construction capability of the combat heavy engineer battalions has probably been best demonstrated over the past several decades by the 18th Engineer Brigade stationed in Germany. Units stationed in the United States must avoid competing with civilian labor which restricts the types of projects that the engineer units can undertake. Germany represents a mature theatre with every available means of support and no restrictions on what engineer soldiers may attempt.

Engineers stationed in combat heavy battalions in Germany have built computer centers, battery control centers, dental clinics, vehicle hardstands, helipads, and asphalt paved roads. The size of projects have ranged from a squad building a chain-link fence to a recent six battalion range upgrade project in Grafenwoehr. Engineer soldiers have been especially effective with prefabricated

structures where the materials arrive in one package and require assembly after a foundation is prepared. The engineers are able to complete more complex projects because technical assistance in the form of a German Civilian Labor Group and Facility Engineer personnel are readily available. In the mature theatre, it is relatively easy to contract for special equipment such as a ditch witch, concrete pump, scaffolding, or a deep excavator that are not organic to the engineer battalion. The projects completed by the 18th Engineer Brigade in Germany represent the maximum capability of the combat heavy battalions. The capability in a remote area where additional expertise and equipment are not readily available is somewhat less.

DEPLOYMENT TO HONDURAS: VERTICAL CAPABILITY

The 34th Combat Heavy Engineer Battalion's deployment to Honduras from 1 October 1987 through 31 March 1988 provides a good example of the vertical capability of the general construction platoon in a remote area. Three separate platoons rotated through Palmerola Air Base in Honduras, each staying for two months. The soldiers constructed a 5000 square foot lounge and club facility which was a two-story, wood frame structure with a dance floor, game rooms, and a wrap-around deck. They also built a 512 square foot, wood frame medical storage facility and a basketball court consisting of 10' x 20' concrete slabs. The structure which required

most of the effort was 40' x 100' Dining Facility -- a modified Army Functional Component System (AFCS) standardized structure. The final building included two bathrooms with full sewer and plumbing, an air conditioned dining area, suspended ceiling, propane gas distribution system, and 800-amp main service with 3 sub-panels.¹¹

ARMY FUNCTIONAL COMPONENT SYSTEM

Before any project can be built, it must first be designed and planned. Someone must assess what the user needs and provide a set of specifications, blueprints, and bill of materials. For a simple project, the battalion S-3 can provide the plans whereas a more complex project may require professional Architect-Engineer or U.S. Army Corps of Engineer (USACE) assistance. The 52nd Combat Heavy Engineer Battalion, for example, relied on USACE design assistance for their projects in Honduras.¹² Design calculations, blueprints, specifications, and a bill of materials requires additional time and money which can be saved if a suitable structure can be found in the Army Functional Component System.

The AFCS is a set of standardized buildings expected to be needed in a wartime theatre of operations. The system contains everything required to construct a base camp to include dining facilities, lounges, barracks, office buildings, and latrines. Other AFCS installations include hospitals, maintenance facilities, heliports, and railroad terminals. For each structure, the blueprints

and bill of materials have already been completed and published in Technical Manuals TM 5-301, 5-302, 5-303, and 5-304. The books also contain planning factors, material procurement process diagrams, construction schedules, and templates for prefabrication of facility components. The wood frame structures are familiar to and within the capability of the combat heavy engineers. They are expected to use this system in time of war.¹³

The constructing unit must adapt the AFCS design to consider actual site conditions. The site layout has to incorporate existing facilities and road networks. The real estate available, topography, existing vegetation, soil conditions, site drainage, and host nation resources must all be considered. The security of a site against a threat may require modification of the plan. AFCS accounts for different climates by publishing separate volumes for temperate, tropical, frigid, and desert regions.¹⁴

Acquiring materials is always a difficult challenge on a troop construction project. The materials for an AFCS structure can be acquired in the United States and shipped to the project site in one package. The materials are listed by National Stock Number (NSN) for easier procurement in the U.S. If the unit finds it more advantageous to purchase materials from the host nation or a third country, the AFCS publishes Foreign Equivalent Construction Stock Item and Local Building Components. This publication provides a country by country analysis of material availability, their compatibility with U.S. materials, and local construction practices

for Europe, the Middle East, Asia, Africa, and Latin America.¹⁵ If the host nation's need can be met by modifying an AFCS structure, the project should be more efficient and progress more smoothly. There is less planning time required and greater assurance that the soldiers can produce a quality product.

CAMINO DE LA PAZ 88: HORIZONTAL CAPABILITY

The 1988 Camino De La Paz exercise in Costa Rica illustrates the horizontal engineer capability in a remote environment. Elements of the 536th Engineer Battalion¹⁶ constructed 11.2 kilometers of road from Valle de la Estrella to Rio Bananito and a 140 foot double-double Bailey Bridge over the Rio Utasi. The gravel road through the hills and rain forest of the Valle de la Estrella in Costa Rica was sixteen feet wide, had four foot shoulders, and required construction of 28 culverts. The project which ran from February through May of 1988 encountered larger than usual amounts of rainfall. The construction crew relied on construction drainage, route alignment, reduced fill requirement, corduroy road construction, and use of a geotextile fabric to alleviate the wet weather conditions.

The Rio Utasi Bridge replaced an existing low water crossing that often flooded and was impassable in the rainy season. The new foundation was created by driving old steel rails into the ground, placing concrete culverts over the piles, and filling them

with concrete which created columns to be used as bearing plates. The unit also provided erosion protection using gabions and reno mattresses made from cobbles found in local river beds. Soldiers erected the Bailey Bridge in two days. A steel mesh deck was used in lieu of wooden planks and required extensive welding.¹⁷

The project was so successful that the 36th Engineer Group built even more bridges and roads in Costa Rica the following year in Camino De La Paz 89. Oscar Arias, the President of Costa Rica, attended the dedication ceremony. One Costa Rican commented that he viewed U.S. monetary aid as a handout and was offended by it. But he felt deeply moved that the U.S. would send their sons and daughters to work in the hot sun to improve the quality of life in his country.¹⁸

The end result of Camino De La Paz 88 was a road link between two remote river valleys and year round access between the coast and the interior for the people of Limon Province, Costa Rica. The projects in Honduras and Costa Rica illustrate the horizontal and vertical construction capabilities of the combat heavy engineers in the type of remote environment where nation assistance projects are likely to occur.¹⁹

SUPPORT REQUIREMENTS

An important consideration when employing a combat heavy battalion in a nation assistance project is the degree of support required. The unit is not self-supporting or self-sustaining and

could not be deployed by itself. In any remote area, the combat heavy battalion would need medical, laundry and bath, water purification, fuel, supply, communication and transportation support. Civil affairs, finance, legal, and public affairs personnel might also be needed depending on the location and duration of the project. The combat heavy battalion has a small medical aid station, mess hall, and direct support maintenance capability for engineer equipment. Any other support must come from somewhere else. Security from military police, an infantry unit, or the host nation military may be required.²⁰

Transportation support might require air, ship, rail, or additional truck support -- especially considering the size and weight of heavy construction equipment. Even on highways, the dozers, graders, compaction equipment, and loaders get transported on low bed trailers. The combat heavy battalion has no authorized supply of construction materials and little means of ordering materials, renting special equipment or contracting for services. A contracting officer is usually needed to support a project. A project may even require psychological operations personnel who are trained to communicate with the local population and capitalize on the good work of the engineers. Anyone authorizing the use of combat heavy engineer battalions for a nation assistance project needs to recognize the support commitment required for a successful effort.²¹

TRAINING BENEFITS OF NATION ASSISTANCE PROJECTS

The combat heavy battalion and the U.S. Army can derive considerable benefit from a nation assistance project. Good training is difficult to find -- especially for the units stationed in the United States where competition with civilian labor, environmental restrictions, and lack of realistic, wartime-type projects are all part of the problem. In a wartime scenario, the combat heavy engineers will probably be constructing in an unfamiliar area and relying on a host nation for resources, materials and construction techniques. In time of war, engineers emphasize solutions that are innovative and timely rather than those which adhere rigorously to established building codes. Duplicating this scenario in a peacetime environment is difficult.²²

Nation assistance projects can provide superb training for wartime missions. The countries where nation assistance projects have been conducted so far and will likely be conducted in the future are much less developed than the United States. Wood frame structures and gravel roads will often meet the needs of these countries. The theatre-of-operations style of construction which engineers are likely to find in a wartime environment is well suited for many nation assistance projects.

On a nation assistance project, the engineers work in a foreign environment with unfamiliar materials, soil conditions, topography, and construction techniques. They must coordinate with

a host nation which may have a different language and culture from their own. The project is real. There are people depending on the unit to complete the project on time. Soldiers can see the immediate results of their effort. Home station exercises can become routine and artificial. Nation assistance projects are neither.

The unit leadership practices project planning, quality control and management in a real-time situation. A successful project requires long-term staff planning. Constructing a road or school in a foreign country becomes an exercise in mobilization, deployment, execution, redeployment, and recovery.²³

In the static environment of the home station, all support relationships are firmly established. A nation assistance project requires the unit to coordinate an entirely new support base acting over extended lines of communication. Many nation assistance projects provide rare and valuable opportunities for active duty and reserve units to work together -- something that will certainly occur in time of war. Nation assistance projects have been conducted at high altitudes, in tropical forests, and in actual low intensity conflict environments. For a unit that is expected to deploy anywhere in the world and provide construction sustainment support to combat forces in a theatre of operations, nation assistance projects can be the best training available.²⁴

The combat heavy engineer battalion is a versatile construction force with numerous vertical and horizontal skills and an impressive array of tools and heavy equipment. As part of the U.S.

Army, they have a massive support organization on which to draw additional assets for deployment anywhere in the world. The combat heavy battalion is limited in the sophistication of projects it can perform and the experience level and training of its assigned personnel. Nation assistance projects have the potential to help our allies and provide superior training for our own forces at the same time. An understanding of the capabilities, strengths, and limitations of the combat heavy engineer battalion is essential in evaluating their appropriateness for a particular nation assistance project.

ENDNOTES

¹U.S. Army, FM 5-100: Engineer Combat Operations. (Fort Belvoir, VA: U.S. Army Engineer Center, November 1988), 13.

²Ibid., 15.

³Ibid., 50.

⁴Ibid., 60.

⁵Ibid., 67.

⁶United States Army Table of Organization and Equipment for Engineer Battalion Combat Heavy, TOE 05415L000 and HHC, Engineer Battalion Combat Heavy, TOE 05416L000.

⁷United States Army Table of Organization and Equipment for Engineer Company, Engineer Battalion Combat Heavy, TOE 05417L000

⁸United States Army Table of Organization and Equipment for Engineer Battalion Combat Heavy, General Construction Platoon, TOE 05417L000.

⁹United States Army Table of Organization and Equipment for Engineer Battalion Combat Heavy, Vertical Platoon, TOE 05417L000.

¹⁰United States Army Table of Organization and Equipment for Engineer Battalion Combat Heavy, TOE 05415L000.

¹¹Deployment for Training to Honduras for Engineer Rotations EN 801, 802, and 803 After Action Report, 34th Engineer Combat Battalion (Heavy), 10 May 1988, 1-3.

¹²William H. Pearce, Interview by author, 28 February 1991, Command and General Staff College, Fort Leavenworth. LTC Pearce, an Engineer officer, is the second reader on this paper and has been selected to command the 536th Combat Heavy Engineer Battalion in Panama.

¹³P157 Operational Warfighting: Sustainment at the Operational Level, Course Manual, (Fort Leavenworth: Command and General Staff College, January 1991), 3/4-11,12.

¹⁴Edward A. Hayes and David C. Wilson, "AFCS: A Flexible Template for Base Camp Design", Engineer 17, no. 4 (March 1988) 22-24.

¹⁵Ibid., 25.

¹⁶The 536th Engineer Battalion at the time was a combat engineer battalion. The horizontal construction was performed by the 15th Combat Support Equipment Company (CSE) which has much of the same equipment as the horizontal platoon of the combat heavy engineer battalion. As such, this project illustrates the capability of both types of units. In the project after-action report, the commander cited the need for 20-ton dump trucks which the combat heavy battalion has. The report cites the lack of vertical construction skill in the 12B soldiers and even asserts that a combat heavy battalion is better suited for this type of project.

¹⁷Camino De La Paz 88 - Costa Rica After Action Report, 536th Engineer Combat Battalion, 18 July 1988, 1- 6.

¹⁸Sid Vogel, Interview by author, 7 February 1991, Command and General Staff College, Fort Leavenworth. MAJ Vogel was the S-3 of the 36th Engineer Group during Camino de la Paz 89.

¹⁹Camino de la Paz 88, 7.

²⁰Phillip Jones, "Engineer Operations Short of War," Engineer 19, no. 3 (Nov 89) 7-8.

²¹Phillip Jones, "Los Ingenieros En El Conflicto De Baja Intensidad," Military Review (Spanish Version) LXVI, no. 12 (December 1986). English translation, "Engineers in Low Intensity Conflict", provided to the author by LTC Jones.

²²Joseph L. Lockett, "Reserve Component Overseas Deployment Training: A Key Instrument Within the Elements of Power", (Carlisle Barracks: U.S. Army War College, 2 April 1990), 15.

²³Ibid., 23.

²⁴Ibid., 26.

CHAPTER 4

PREVIOUS NATION ASSISTANCE EFFORTS

INTRODUCTION

Having examined the perspectives of the concept of nation assistance and the capabilities and limitations of the combat heavy engineer battalion, this chapter focuses on specific nation assistance projects that U.S. Army engineers have participated in during the last decade. By examining the lessons learned from specific nation assistance case studies, general trends can be extrapolated and applied to using combat heavy battalions in general. The conclusions and recommendations will be largely based on what has succeeded and failed in the recent past. All of the projects took place in remote and underdeveloped areas, specifically in Africa, Latin America, the Middle East, and the South Pacific.

THE DIRKOU AIRFIELD -- NIGER

The Dirkou Airfield project, located in the northeast section of Niger, was the United States' first Civic Action Project on the continent of Africa and aptly illustrates the pitfalls that can befall even the best intentioned nation assistance effort. The upgrade of a remote airstrip was scheduled for two months and ended up

requiring sixteen months to complete. The project was so far over budget that it consumed most of the year's civic action money for the continent of Africa. The poor estimating and lack of progress strained relations with the Nigerien government.¹

The project discussion started in 1984 when a civic action team visited Niger to discuss upgrading the Dirkou airfield to accomodate the Nigerien Army's C-130 aircraft. The airfield was originally constructed in 1956 by the French using prison labor and the pavement had gradually deteriorated.² Secretary of Defense Weinberger approved the project when Nigerien President Sidi Kountche visited Washington in December 1984 and a letter of agreement was signed in 1985.³

The plan called for a Nigerien Army engineer unit to do the construction and the United States to provide a *Mobile Training Team* (MTT) to train and advise the Nigeriens. The U.S. agreed to provide the materials, fuel, and support equipment which included a crusher, aggregate spreader, and asphalt distributor.⁴

The project was a 1605 meter by 25.6 meter C-130 runway, a parking area, and a taxi way -- all which required a bituminous surface. The work involved sub-base preparation, a 20 centimeter thick base course, double bituminous surface treatment, and a bituminously bound sand seal. The resulting runway was over 50,000 square meters of pavement.⁵

The Corps of Engineers sent a survey team from their Middle East Division to assess the cost and availabilty of materials, the

best procurement procedures, the capability of the Nigerien Army engineer company, and the requirements for training and technical assistance. The survey team remained on site for only two days. A six-man Mobile Training Team arrived at Dirkou in July 1987. The team leader was a captain who taught paving and surfacing at the Engineer School at Fort Belvoir. An Army medic assigned to Germany and four engineer non-commissioned officers (NCO) from Fort Leonard Wood comprised the rest of the team which made mobilization more difficult. The team leader did not even know the capabilities of his team members and had no choice in their selection.⁶

The crusher was supposed to be delivered by aircraft to Dirkou. The Corps of Engineers who purchased the crusher from PORTEC, a civilian company, never coordinated with the Air Force to see if it would fit on a C-130 aircraft. It did not and the crusher had to be trucked over land at an exorbitant cost not to mention damage to the crusher. The civilian rock crusher was unfamiliar to the MTT and had inadequate assembly instructions. PORTEC eventually provided technical and maintenance assistance through a technical representative.⁷

The project had no clear chain of command and nobody was directly responsible for success or failure. Originally the Nigeriens were slated to manage the effort but the task later fell to the Defense Attache Office (DAO) in Niamey as an extra duty. The DAO representatives were members of the State Department

diplomatic/intelligence corps and a remote construction project was not their highest priority. The Niger Ministry of Defense, U.S. European Command, Department of the Army Procurement Agency, U.S. Embassy Niger, and the Corps of Engineers all had supporting roles but nobody was in charge. Nobody was enforcing suspense dates, managing the coordination between agencies, and anticipating the problems.⁸

A number of construction difficulties quickly verified the lack of planning. The site survey's rosy 60 day project duration was based on availability of rock in proximity to the airfield location. The local rock was too large for the crusher, too soft for an adequate sub-base, and contained too much sand. The MTT never was able to get permission to blast so an inordinate amount of time was lost searching for suitable rock.⁹ Once found, it had to be hauled to the site in dump trucks. Dump trucks drove a total of 120,000 kilometers, roughly three times around the world, hauling rock.¹⁰

The RC 3000, a brand of asphalt purchased from Mobil Oil, was inadequate. It would not cure and remained sticky a month after being placed. A dispute arose between Mobil and the constructing unit concerning whether the asphalt really was RC 3000 or whether the unit had properly cut it with kerosene or used improper application rates. The brand was not common to southwest Africa and new asphalt was ordered from Shell Oil.¹¹

Some critical equipment such as a crusher dolly, rotary broom, rock bucket, and asphalt kettle were ignored during the

planning process. The result was soldiers having to remove asphalt from barrels using hand-held blow torches in the hot sun. Required equipment broke down and only the resourcefulness of the soldiers on site kept the project going.¹²

The increased hauling caused fuel costs, spare parts supply, and maintenance efforts to skyrocket. The nearest support base was in Niamey which was over six hours by air or three days by driving overland. The only communication with Niamey was the twice weekly flight or the telegraph which was operated by people who spoke little English. Garbled messages were common. It took roughly two weeks between when a routine request was made to when the item arrived on site.¹³

The project quickly bogged down. In October, the original MTT was replaced by a new crew from the 249th Engineer Battalion (Heavy). Five Mobile Training Teams eventually rotated through with each staying approximately three months. The last three MTTs were supplied by the 293rd Engineer Battalion (Heavy). The Nigerien engineer unit remained on site for the entire sixteen months.¹⁴ Good relations became difficult as each new crew gave different advice and had to establish a good rapport. The Nigeriens spoke French. The later MTTs sent some soldiers who spoke French but the first crew had to resort to hand and arm signals to communicate with the people they were supposed to train and advise.¹⁵

The project management gradually improved. Permanent liaison officers were assigned to help get supplies and materials,

solve problems, and coordinate with the Niger officials. The U.S. Army Europe Deputy Chief of Staff - Engineer personally briefed a very upset President Kountche and the Army committed to complete the project regardless of the cost.¹⁶ The first step to recovery was to remove a substandard portion of the airfield that had already been completed and start over with better asphalt and more suitable sub-base material. The extra equipment was finally purchased and arrived on site. With time, the support system improved. The project was by no means easy but once more money and more support personnel were added, the project could at least be completed.¹⁷

The project was finally turned over in December 1987 at a cost of \$2.8 million. A final controversy centered on the demobilization. Bringing the Nigerien equipment back to a reputable state of maintenance required extra money. To have balked on this last step could have erased the goodwill that was eventually generated by the completed project.¹⁸

By spending the extra money and taking the extra time, the United States was able to call the project a success. The Nigeriens did have a completed air strip that they did not have before. They have some new equipment and the training and experience to build another air strip for themselves. Their access to that remote section of the country was greatly enhanced. Judging by Niger's proximity to both Chad and Libya, it can be argued that the improvement of the air strip and the maintenance of relations with Niger was in the United States' best interest. Overall the soldiers

of both Niger and the United States grew to respect and appreciate each other.¹⁹

Still much can be learned from the number of mistakes that were made. The Nigerien Engineer Company was trained and equipped by the German Army. The Germans maintained a permanent six member staff in Niamey and had supervised a similar airfield project at Diffa. The Germans could have offered timely and valuable assistance. We chose not to work with them and were not sensitive to the German's relationship with the Nigeriens.²⁰

The Dirkou Airfield was meant to be a showcase to the rest of Africa to demonstrate what American nation assistance could accomplish.²¹ Despite the ultimate success, the rest of Africa got to witness some of the frustrations that accompany American assistance. The project was too complex for our initial attempt on the African continent. If the U.S. had tried a smaller effort, some of the same problems would have surfaced on a minor, less costly level. With the lessons learned from a smaller effort, the Dirkou project may have progressed more smoothly.

The chain of command needed to be clearly identified and responsibility firmly affixed. With the ad hoc assembly of the first MTT and the nebulous support mechanisms, the project was destined for difficulty. There needed to be more time and effort put on the planning process. The initial site survey should have been more detailed and should have included the people who would actually have to do the project.

It is debatable whether sending a U.S. combat heavy battalion to complete the airfield would have been a better solution. The command and control structure would have been much clearer and the initial planning would have undoubtedly been better. An engineer company assigned the mission would have been supported by the staff and planning assets of their battalion and brigade. The training would have been superb. On the other hand, the expense of bringing the battalion's own equipment would have been high. More importantly, the Nigerien Army would have been denied the training, experience and equipment gained by doing the project themselves.

USACE CONSTRUCTION IN SAUDI ARABIA

Some nation assistance projects are more appropriate for combat heavy battalions than others. It is hard to find a project less suitable for combat heavy battalions than the Corps of Engineer construction in Saudi Arabia. The U.S. Army Corps of Engineers (USACE) has been involved in large construction projects in Saudi Arabia since 1965 when the countries signed an Engineer Assistance Agreement. Essentially USACE provided Saudi Arabia with technical construction management support for construction of defense facilities.²²

The USACE effort peaked in 1983 with \$1.8 billion in construction and the involvement of 1275 USACE employees.²³ The projects included two naval bases, King Abdulaziz Naval Base at

Jubail and King Faisal Naval Base at Jidda, valued at \$1.7 billion each. The King Khalid Military City at Al Batin cost \$6.5 billion and was the largest single military construction project in the Corp's history. The \$1.5 billion King Abdulaziz Military Academy in Riyadh was modeled after the U.S. Air Force Academy. The total package also included the enlargement of three F-15 air bases and amounted to over \$15 billion in new facilities.²⁴

The nation assistance effort seemed to benefit both nations. The United States used its engineering and construction management skills to improve relations with the Saudi Arabian government. The designs were prepared in the United States and resulted in Architect/Engineering contracts in 46 U.S. cities for \$249 million. Most of the materials were purchased in the U.S. which helped our own economy.²⁵ The Saudi government paid the entire cost. The advantage to Saudi Arabia was several new state-of-the-art defense facilities. Saudi Arabia is a moderate, oil rich nation in a very tense area of the world where the U.S. has vital national interests. Improving Saudi Arabia defense capabilities served the needs of both nations. Certainly these facilities were useful during the Desert Shield/Desert Storm crisis of 1991.

While these projects were valuable nation assistance efforts, they were totally unsuited for combat heavy battalions. They were too large and complex for troop construction. The typical cost of a large combat heavy nation assistance project has been \$2 - 3 million. Engineer soldiers have neither the skill nor the equipment

to build a modern naval base. Uniformed U.S. Army soldiers working in Saudi Arabia would have been highly controversial and the Saudi government probably would not have approved the project. To give the work to Army soldiers would have denied the work to civilian contractors. Saudi Arabia is a rich country which can afford to pay civilians to complete the work. Any one of these reasons would be sufficient for not using combat heavy battalions. All three together make these projects totally inappropriate for combat heavy battalions.

USACE is a superb source for nation assistance. In the 1950s and 60s, the Corps of Engineers built Karachi International Airport in Pakistan, modern ports for Somalia, a highway system in Afghanistan, roads and harbors in Greece, and rehabilitated ports in Korea. In the Middle East alone, the Corps has built two air bases in the Negev Desert for Israel, an air base for joint use with Oman on Masirah Island, a biomedical research lab in Egypt, and an armor rebuild facility in Jordan.²⁶ The Corps of Engineers has been used to project U.S. technological and engineering power overseas.²⁷

The Corps of Engineers can be expensive. The host nation is expected to reimburse USACE for their efforts. USACE may be less feasible for a nation unable to pay for large construction projects. The costs of construction can rise exponentially in remote areas. When USACE was constructing airfields in Morocco, it was difficult to recruit competent people who were willing to leave their families behind. The Corps had to offer attractive salaries and

provide family housing to persuade skilled engineers to come.²⁸ The combat heavy battalions do not have this problem. They may not be as skilled as some civilian contractors but they go where they're told and don't require comfortable accommodations.

There is little overlap or competition between USACE and combat heavy battalions. They fill different roles and USACE will often support combat heavy battalions with design or technical support. USACE is best suited for large expensive technical projects. The combat heavy battalions are much better at smaller, less complex projects. Their advantage is most apparent to a customer with a simple project in a remote area and not much money to pay for it.

AHUAS TARA 89 -- HONDURAS

A large proportion of Army engineer nation assistance during the last decade has taken place in Southern Command (SOUTHCOM) largely as a result of political events and the initiatives of General Paul Gorman, the SOUTHCOM commander in the early 1980s. Faced with an insurgency in El Salvador and an unfriendly government in Nicaragua, military planners noted that the limited infrastructure in the theatre could not support large scale military operations if they were ever needed. Since Congress was appropriating only limited funds to solve the problem, Army engineers conducted a series of training exercises to build roads,

airfields, and base camps -- most notably the AHUAS TARA exercises in Honduras. AHUAS TARA which translates to BIG PINE started in 1983, revived nation assistance in Latin America, and expanded into a series of annual construction missions.²⁹

The AHUAS TARA exercises were followed closely by Fuertes Caminos exercises (Blazing Trails) which used Reserve Component units on their annual deployment for nation assistance and other Deployment for Training (DFT) exercises using Active Duty engineers. Since the AHUAS TARA exercises were similar in scope, complexity, difficulty, and location, it would be repetitious to expound on each in detail. Instead, choosing AHUAS TARA 89 as a representative sample offers a good overview for the role of engineer battalions in Honduras.³⁰

Elements of the 937th Engineer Group which included two engineer battalions, a bridge company, a quarry section, two well drilling detachments, and a support battalion deployed in January 1989 to complete both vertical and horizontal construction in Honduras. The \$3 million project included 1800 soldiers from five different installations and over 800 pieces of equipment.³¹ Most of the horizontal work took place at the San Lorenzo Field Landing Strip and consisted of a taxiway, logistical storage area, fuel storage facility, and port staging area.

The taxiway required a bituminous coat but most of the work was gravel hardstand and earthen structures. The units built a 5.7 kilometer road from Las Marias to San Antonio de Padua. The San

Antonio Road was built over mountainous terrain, had ten switchbacks and steep slopes, and required 5000 pounds of dynamite to complete. Significant local labor helped with the culvert headwalls, diversion ditches and low water crossings. The Hondurans helped teach the engineers some local construction techniques.³² Other projects included four schools, an administration building, improvements on a clinic, reconstruction of a bridge in Tierra Blanca, and the drilling of nine wells. Most of the buildings were Central American Tropical Huts (C-Hut) -- standardized AFCS structures designed for a tropical environment.³³

Part of the mission was to train a Honduran military engineer battalion which consisted of three companies of combat engineers and one company of construction engineers. The Hondurans attached a platoon of engineers to a company of U.S. engineers for training which proved to be a good ratio where the supervisors were not overburdened. The difference in language was difficult but not insurmountable since a limited number of interpreters were available.³⁴

The delivery, quality, and procurement of construction materials all presented difficulties. The materials were purchased locally. The contracting personnel were local nationals with little interest and competing priorities. They did not feel the same sense of urgency as the construction unit. The unit felt they needed a full time contracting officer whose primary mission would be obtaining

materials for the project. The contracting officer would ideally have engineering/construction experience and be bilingual.³⁵

The quality of the local materials was less than expected. The lumber arrived wet, deformed, and had no uniformity in dimensions or mill shapes. The Honduran lime did not meet the specifications for granulation or hydroxides and clogged the dispensing equipment.³⁶ The Honduran contractors tended to overcommit, misrepresent their products, and were often late in delivery. Materials got delivered to the wrong base camp and materials destined for multiple projects got mixed up in the haste to off load them. The unit recommended non-performance penalties for any future contracts.³⁷

The largest operational problem was the quarry operation and rock crusher. The antiquated 75 ton per hour crusher was constantly breaking down. The soldier's lack of experience on the equipment and the scarcity of parts delayed the project. The Army leased a civilian rock crusher which worked much better and needed parts were purchased locally. The lease called for a technical representative to train the soldiers but the leasing company determined the area was too dangerous. With some training, engineer soldiers proved capable of operating and maintaining the modern equipment. After the fact, the unit recognized that the project would have been more efficient if the crusher had been in place and producing gravel two to four weeks prior to the arrival of the main body.³⁸

The engineer officers in charge of monitoring quality control were inexperienced and lacked an understanding of civil engineering. There were inadequate quality control standards and even those were not amply enforced. The supervisors lacked basic knowledge in concrete, asphalt, and soil stabilization techniques.³⁹ Many engineer officers do not have engineering degrees and the only training they receive in such topics occurs in their officer basic and advanced courses.

Part of the commander's guidance for the mission was to maximize the involvement of the Hondurans. To enhance the government and military image to the local population, the task force commander participated in numerous Honduran news conferences where he emphasized the commitment to civic action projects. The task force consulted Honduran civilian engineers on design changes and modifications of work. Honduran civilian and military dignitaries were in charge of project dedications. The President of the Honduran Congress opened the San Antonio road.⁴⁰ The projects were chosen by the Hondurans rather than U.S. planners. This was often difficult since the Hondurans wavered several times on whether the difficult, high risk San Antonio road was a high priority or not. The planners scheduled construction activity to minimize disruption to the local population.⁴¹

The base camps were constructed within seven days and security from terrorism, insurgency, and local theft or pilferage was a major concern. The physical security included a concertina

perimeter fence, individual fighting positions, and guard towers with sand bags and directional lights. The unit built serpentine guarded entrances to discourage truck bombs. One third of all forces outside the base camp were armed.⁴²

The task force relied heavily on guards from a Honduran infantry battalion. The Hondurans were 14 to 19 years old and had little or no education. They worked side by side with U.S. guards and proved invaluable. The local civilians knew that American soldiers would not harm them especially due to the strict rules of engagement imposed on the task force. The Honduran guards had no such rules. They were alert at night, fired lots of warning shots and boldly apprehended intruders. The presence of Honduran guards prevented any incidents between the local population and U.S. soldiers and deterred theft which was in reality the biggest threat.⁴³

Despite major difficulties, the three month project successfully enhanced cooperation between the U.S. and Honduran militaries and helped provide a positive image of the Honduran military. Combining the airfield project with building local roads and civic action projects served to both develop the theatre from a military standpoint and aid in the development of the local community. The exercise provided valuable training for both the Hondurans and the U.S. engineers. Mixing Honduran soldiers in with American soldiers in small numbers proved to be one means where U.S. engineer battalions can help train host nation personnel.

TASK FORCE ROCK EAGLE -- BELIZE

Task Force Rock Eagle's project in Belize from February 1987 to May 1987 shows how well a nation assistance effort can proceed if the unit is given sufficient time to plan prior to deployment. Task Force Rock Eagle consisted of elements of the 20th Engineer Battalion, 584th Maintenance Company, 227th General Support Company, 501st Signal Battalion, and the 92nd Engineer Battalion. The focus of the project was to open transportation routes along the coast between Belize City and Dangriga. The primary effort was to replace the deteriorating bridge over the Mullins River. The bridge provided year round access for local farmers to the port and commerce center of Dangriga since the old bridge often flooded during the rainy season. The project finished ahead of schedule largely because of no inclement weather, good maintenance support, quality construction that was done right the first time, and availability of materials. The Ministry of Works quickly obtained any materials not already on site.⁴⁴

Belize is the only English speaking country in Central America so there were no language difficulties. Belize gained its independence from Britain in 1981 but remains in the British Commonwealth of Nations. The small Belizean Defense Force was trained mostly by British and American forces. The population is only 150,000 people. Many of the people in the area of the project

had relatives in the U.S. and several local men were in the U.S. Army so relations were friendly and trusting from the outset. Nine members of the Belizean sapper platoons worked with the U.S. soldiers through the project.⁴⁵

There was excellent coordination between the construction force and U.S. agencies already in Belize. The United States Agency for International Development (USAID) helped obtain the bridge set that the soldiers erected and was a valuable source of information on Belize and its construction practices. The Military Liaison Office (MLO) for SOUTHCOM in Belize was involved in the planning process from the beginning and helped considerably with the face to face coordination. The U.S. Embassy in Belize City helped coordinate visits from dignitaries and arranged the final dedication ceremony.⁴⁶

The 20th Engineer Battalion received a mission directive nine months before the project was started. The unit conducted a week-long, on-site, reconnaissance and began detailed planning. The planners were able to identify problems early and held several in-progress reviews to solve them. After-action reports from other units helped prevent previous mistakes from being repeated. The unit had a fund cite two months prior to deployment and were able to order logistical supplies. The final construction drawings and the contracts for shipping the construction equipment were ready a month prior.⁴⁷

The construction equipment which included an air compressor, dump trucks, loader, backhoe, concrete-mobile, dozers, crane, and a forklift was hauled by commercial truck to Jacksonville, Florida. The equipment was loaded on a barge and arrived five days later in Dangriga. The advance party off loaded the equipment and transported it to the project site using Belizean Defense Force transportation assets. The soldiers in the advance party and main body arrived in Belize City on Air Force C-141 aircraft and obtained bus transportation to the project site. There were minor problems such as conexes breaking open and some minor damage to equipment but the overall operation progressed as planned. Having school trained movement personnel in the unit helped immensely.⁴⁸

The base camp was mostly tents built on plywood floors. The unit built a shower facility by hanging a canvas bag from a metal tent frame and creating a sloped floor. The four-man latrine consisted of plywood seats and 55 gallon drums waste receptacles which got burned three times a day. For recreation, soldiers built a basketball hoop, volleyball court and a horseshoe pit.⁴⁹

The Ministry of Works completed the first phase of the bridge construction which involved clearing land, surveying the site, and driving piles to support the concrete abutment. The soil core samples taken by the Ministry of Works were 100 feet from the site and inaccurately located the water table. The abutment design had to be changed to prevent excavation and concrete formwork from

extending below the water table. The piles were crooked after being driven which brought another on site design change.⁵⁰

The bridge set was a 40 year old railroad bridge and the anchor bolt spacing on the plans was incorrect which required a modification to the base plate on the bridge. The bridge parts were old and the steel connections had to be soaked in solvent before they could be used. Each drift pin became a struggle that was usually settled with a sledge hammer. Since the bridge weighed over 100 tons, the crane became the most critical piece of equipment on the project. The quality control, particularly in monitoring the quality of coarse aggregate and the batch proportions on the M919 Concrete Mobile, was carefully supervised.⁵¹

Task Force Rock Eagle included a significant number of communications, medical, maintenance, supply, and food service support personnel. Developing and procuring a list of all types of supplies to bring on the mission constituted a major portion of the planning. A Joint Task Force (JTF) Bravo liaison team located in Honduras had the full time responsibility of providing logistical support to the project. The unit relied heavily on resupply from weekly CH-47 helicopter flights. The communications to Belize City, JTF Bravo, and Fort Campbell was primarily Radio-Teletype (RATT) rig and tactical satellite (TACSAT).⁵²

The unit proposed doing additional civic action projects that were estimated at \$30,000. The funding was denied but the engineers still managed to grade a soccer field, improve a road for

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levels alpha through delta which ranged from unarmed guards, to soldiers carrying axe handles, to eventually issuing weapons and loading magazines only under orders.⁵⁴

Task Force Rock Eagle's project was well planned in both construction and support requirements. The unit was given enough planning time in advance to provide a smooth execution. The Belize Ministry of Works' effort to have all materials available certainly led to the project's success and early completion. The prompt completion of the Mullins River bridge, the training of both the U.S. and Belizean engineers, the goodwill gained by the effort, and the well planned support network all led to a successful project.

POTENTIAL EFFORTS IN PERU

The United States has been considering nation assistance projects in South American countries such as Colombia, Peru, and Bolivia with the additional purpose of using nation assistance to help with the drug eradication effort. The rationale is that engineers on nation assistance projects will foster closer ties between local governments and the United States. Specifically, building roads in carefully selected locations can reduce the potential for insurgency by promoting free enterprise, improving communication, providing farmers a better way to get their legal

crops to market, and providing security forces easier access to the drug producers who often locate in remote areas.⁵⁵

The effort in Peru is still in its infancy. When General Gorman surveyed the Latin American countries for their nation assistance priorities, Peru responded with a request for three battalions of engineer equipment. Peru had received U.S. equipment assistance in the 1960s and most of the equipment was old and needed spare parts. The Peruvian military has been involved in road building since the 1930s and their biggest obstacle to progress has been equipment shortages.⁵⁶

Peru did, however, authorize the 1987 Fuerzas Unidas exercise where a squad of U.S. Army engineers worked side by side with a platoon of Peruvian engineers painting a schoolhouse and building tables and chairs. A proposal for hosting the 1989 Fuertes Caminos exercise was turned down because Peru was in the midst of municipal and national elections but the door was left open for a future exercise.⁵⁷

The potential U.S. contribution is immense considering the lack of roads over the Andes mountains which separate the industrial and population centers in the west from undeveloped oil and mineral deposits in the east. Even if engineer units built needed roads along the coast, it would free the Peruvian military to build the tough roads over the mountains. Furthermore, selective construction of key roads and airfields will help the counterdrug forces reach the remote areas where coca leaf grows unhindered.

The careful selection of projects is critical to prevent giving the drug producers increased access to a market.⁵⁸

U.S. nation assistance in Peru would not compete with the civilian economy. The sources of roads in Peru are predominately the private companies who build roads to suit the needs of their individual corporations, the Ministry of Works, and the Army. The Ministry of Works contracts with civilian firms but has many more projects than they have funds available. The Ministry of Works contracts with the Army for roads in the remote, less secure areas.⁵⁹ Working with the Peruvian Army on remote projects is where the U.S. Army combat heavy battalions can make the greatest potential contribution. While our nation assistance effort in Peru has been meager to date, it is an area that bodes well for the future.

FUERZAS UNIDAS 89 IN BOLIVIA

The efforts of U.S. Army engineers in Bolivia, another South American country known for its supply of cocaine, have been more substantial. The Fuerzas Unidas 89 project was completed by the 536th Engineer Battalion, the 15th Combat Support Equipment Company, and Naval Mobile Construction Battalion 40. The support forces came mostly from the 324th Support Group and included medics, direct support maintenance, fuel handlers, communications personnel, military police, a contracting team, and a public affairs detachment.

Fuerzas Unidas 89 was the first phase of a multi-year effort to upgrade the Potos airfield for commercial jet traffic. The majority of the work was excavating 200,000 cubic meters of earth and completing some minor civic action projects. The future phases will include more excavation and some road construction. The purpose is to increase tourism in the vicinity of Potos.⁶⁰

Aside from being the first nation assistance effort in Bolivia, the project is located at an altitude above 10,000 feet which provided some unique challenges. Soldiers were medically screened for potential high altitude sickness problems and underwent a six-day acclimitization period prior to the start of construction. The thin air provided a dry, cold, low humidity environment that fostered nose bleeds, sore throats, and dry mucous membranes. Many soldiers had to stop wearing contact lenses that were dehydrating and had to wear sunscreen to prevent excessive sunburn.⁶¹

The construction equipment also performed much differently at the higher altitudes. Aside from a loss of engine power in some equipment, the repair parts supply proved inadequate because items were failing that had never experienced problems before. There was no historical base in that environment for predicting necessary part supply levels. Since the average order to ship time for parts was 11 to 15 days, the operational readiness rate dropped while awaiting

parts. On an excavation project, success is almost exclusively dependent on keeping the equipment running.⁶²

The units shipped some of their own equipment such as 17 milvans, 6 dump trucks, 4 dozers, 3 loaders, 2 graders, and 2 backhoes with them. It took two weeks to move 60 pieces of equipment and 280 troops from Panama to La Paz, Bolivia. The Bolivian railroad required three weeks and four trains, a total of 60 cars, to move from La Paz to Potos. The redeployment after the project was worse. When Bolivia was only able to provide two trains for the trip home, an additional train had to be contracted from Chile. The trains were so late and broke down so often that the delays caused the unit to miss their scheduled boat from Arica, Chile. The redeployment planning was hindered by national elections which resulted in a new president on 6 August 1989 and a correspondingly high turnover of government personnel.⁶³

The unit contracted some equipment locally assuming there would be fewer problems. The problems were just different. The contracted equipment included 8 dump trucks, 2 loaders, and 5 dozers. Additionally, the host nation provided a screening system, a water distributor, and a vibratory roller. The average late arrival for each piece of equipment was thirteen days which hampered the schedule. The equipment broke down frequently and did not comply with the contract specifications. In many cases, the wrong equipment was sent or was missing critical attachments such as dozers with the wrong blades or without ripper attachments.⁶⁴

Additional delays were caused by a faulty initial site survey which had to be redone, poor fuel, low quality local materials, and haphazard contracting. The site had inadequate fuel storage capacity. The inconsistent fuel delivery occasionally left the project without fuel to run equipment. The poor quality fuel tended to clog fuel filters. The local lumber was hard and sometimes warped. Soldiers had to drill holes prior to driving a nail. The contracting officer was not designated until late in the planning process which caused the contracts to be late and rushed.⁶⁵

The delays were mostly offset by the troops working longer hours. The planning began in earnest in January 1989 and the ship carrying the returning equipment arrived back in Panama on 6 November 1989. The actual construction occurred between 21 June 1989 and 23 September 1989. The schedule originally called for an eight hour day because of the perceived effects of the high altitude. The altitude effects were overestimated and the work day gradually increased to ten hours and the work week to six and a half days. The unit even instituted a night shift to stay on schedule. The troops were exhausted at the end but the first phase of the project was successfully completed on time.⁶⁶

The task force managed to complete various humanitarian and civic action projects in seven different locations. The projects included two 20' x 48' prefabricated buildings in St. Lucia; plumbing, electrical, and roof work on a community center in Don Diego; water line and PVC pipe installation in Huari-Huari and Apacheta; and 18

kilometers of road improvement in Pacamayo. Furthermore, the task force was able to train elements of C Company, V Bolivian Engineer Battalion on the 5 ton dump truck and the D7/D8 dozers.⁶⁷

Security became critical on the project as terrorist groups such as Zarate Wilka threatened the task force and promised to kill an American. A Bolivian infantry battalion with the occasional augmentation of a military police platoon provided base, convoy, and job site security. Fortunately there were no major incidents.⁶⁸

Relations between local citizens and the U.S. soldiers were excellent. There were numerous official visitors and social visits to include 13 soldiers practicing the local folk dancing and participating in the Fiesta de San Barthome which received television coverage. The country team and host nation conducted an active media campaign to inform the newspapers, radio, and television of the project's purpose and progress.⁶⁹ Some leftist publications provided initial resistance to the U.S. project. One paper showed a picture of a U.S. soldier sitting on a pile of duffel bags holding an M-16 with the caption that U.S. invades Bolivia. By the end of the project the sentiment was overwhelmingly positive and many were sorry to see the U.S. soldiers leave.⁷⁰

The public relations office conducted a Media Day on 21 August 1989 which included the three major Bolivian newspapers, Presencia, Hoy, and El Diaria. The British Broadcasting Corporation, Christian Science Monitor, Reuters, and France Presse also showed up. Newsweek even published a full page article in their

international edition on the project. The public affairs detachment wrote several articles and produced a short video. The active press campaign is especially important when U.S. presence in a country is new and being attempted on a trial basis. The press helped promote a positive image for a project that could have been very controversial.⁷¹

The initial success in Bolivia will hopefully lead to greater cooperation between the two governments and may produce opportunities to work with other South American countries. Fuerzas Unidas 89 illustrates how a large project can be divided into multi-year pieces to insure the short duration of any individual portion. Working soldiers for long hours in a remote, harsh environment cannot continue over an extended period of time without hindering both morale and effectiveness. Even though the technical complexity of hauling earth is not difficult, the logistics of moving and maintaining equipment in remote areas and unfamiliar environments can be a nightmare.

ABRIENDO RUTAS IN ECUADOR

The 1169th Engineer Group (Alabama National Guard) assembled a task force that involved over 8,000 soldiers from the National Guard, Reserves, and Active Duty components to build roads and bridges through the rugged interior of Ecuador. The exercise, originally designated Blazing Trails, was initially planned as a

coastal road within easy reach of the port of Manta. In fact, 450 pieces of engineer equipment were already enroute to Ecuador from Mobile, Alabama for this project when a massive earthquake hit the Ecuadorian interior and destroyed roads and a critical pipeline.

The Ecuador government requested help and the project was redesignated Abriendo Rutas (opening roads). The task force effort shifted to opening roads to connect Archidona to the remote Oriente which meant crossing the Andes mountain range. Instead of being close to a port, the task force had to convoy heavy equipment on a three day journey over the Andes.⁷²

The project lasted from June 1986 to December 1987 and involved the frequent rotation of soldiers. Many of the National Guard and Reserve soldiers were sent for their two-week annual rotations. Between travel and orientation, seven to ten days was the maximum productive time these soldiers could contribute. Colonel Frank N. Sefton, the task force commander, concluded that while the training was useful, the rotation period was just too short to be effective to the project.⁷³ The task force composition was 60% National Guard, 25% Reserves, and 15% Active Duty personnel.⁷⁴

The Army emphasis on the project was training for U.S. engineer soldiers. Commanders expected that mistakes would be made. Ecuador was in the middle of an election campaign and the Ecuadorian press capitalized on this attitude and the number of soldiers that rotated through. The leftist opposition party claimed

the project was a waste of Ecuador's meager resources and a ploy to train U.S. soldiers.⁷⁵

Contracting was often a problem because the contracting officer did not work directly for the task force commander and did not always share the same sense of urgency or the same priorities as the constructing unit. U.S. Army South created a forward headquarters to handle embassy liaison functions but the project would have progressed more efficiently if they had worked for the task force commander.⁷⁶

The construction was accomplished with a heavy reliance on air support and individual ingenuity. The soil was a slippery clay that turned to soup when the top soil was stripped. Soldiers used local timber to create a corduroy road that floated a layer of rock used for the base course. Road drainage was essential and was done mostly with shovels and hand labor. The local Ecuadorians showed the U.S. soldiers a number of local techniques for handling timber and constructing diversion ditches.⁷⁷

The Army's heavy dozers and dump trucks sank in the soft soil. The task force leased lighter dozers and tracked backhoes to complete the project. Flash floods during the rainy season caused the rivers to rise up to six feet in an hour. Two air compressors and a concrete pump got washed down river when the water rose faster than expected.⁷⁸

The 92nd Combat Heavy Battalion built the center pier and the abutments for a bridge across the Rio Hollin. The center pier had

to be sunk 17 feet into the muddy river bottom. The foundation was filled with rocks by hand while pumps worked to keep it dry. Concrete production was difficult and kept to a minimum. When needed, it was delivered in concrete buckets by Chinook helicopters. As a result, the abutments were made of gravel-filled gabions. The 145th Engineer Battalion of the Alabama National Guard erected an ACROW bridge, an updated version of the Bailey bridge, in just three days.⁷⁹

Despite the difficulties of changing a plan midstream, multiple rotation of troops, and constructing in a remote area, the units received unique training in a tropical environment under difficult conditions. The Ecuadorians who were no longer isolated and could move to and from the local markets were genuinely grateful for their efforts. An active press campaign, similar to the one conducted in Bolivia during Fuerzas Unidas 89, would have helped stifle opposition to the project.

CATS ON PANAPE

While the Navy construction battalions have completed many projects in the South Pacific, the Army's role has been minor. The 84th Engineer Battalion stationed in Hawaii has completed some nation assistance work as part of a Civic Action Team (CAT) on Panape, a small island located 1,100 miles southeast of Guam. The

objectives of the project were to assist the economic development of Panape, train for the Panapean people, improve the relationship between the United States and Panape, and maintain a military presence in Micronesia.⁸⁰

The project was scheduled for a five year period with a new CAT arriving each year. Team 84-2, the second team in the project, worked from May through November of 1981 building 2300 feet of road around Panape and constructing base camps. The CAT consisted of 13 men comprised of special forces, medical personnel and engineers. The engineers were hand picked and were cross-trained on the 18 pieces of equipment they brought with them.⁸¹

Kolonia, the capital of Panape, has the only water and electrical facilities on the island. The natives speak little English and few items are available from the local economy. The CAT had to supply their own potable water and generate their own electricity for their basecamp. C-130 aircraft supplied the team once a month.⁸²

The Panape Transportation Authority designed the road which required a 6" to 12" coral cap. The coral which was the only available source of aggregate had to be dredged from the sea and crushed by running a truck over it. The constant rain combined with the volcanic clayey soil caused numerous delays. The CAT managed to accomplish some smaller projects such as renovating a high school track, clearing some home sites, and constructing concrete foot bridges.⁸³

The relations with the local population were understandably good with such a small, superbly qualified crew. The only detractor is that the CAT was supplied by the combat heavy battalion. The engineer part of the team typically consists of a first lieutenant, an E-8 to act as NCO in charge, two NCOs (grade E-7) with expertise in vertical and horizontal skills, an E-7 for maintenance, and two staff sergeants (E-6) to complete the team. While this may seem minor, it represents a significant portion of the leadership of the combat heavy battalion. The team represents the loss of a company executive officer, a company first sergeant, two platoon sergeants, a company maintenance NCO, and two squad leaders which severely reduces the supervision and leadership that the unit depends on to train and accomplish its mission.⁸⁴

OPERATION "NO-PROBLEM" -- JAMAICA

From 21 February through 25 March 1989, elements of the 120th Combat Heavy Engineer Battalion of the Oklahoma National Guard repaired and renovated nine medical clinics and nurse quarters for the island of Jamaica. Since there is no U.S. Army Headquarters on the island, the unit worked directly for the U.S. ambassador in support of the Minister of Construction Jamaica. The materials, fuel, ration supplements, services, and some tools were all locally purchased. The Jamaican Defense Force provided a 10

member section for base camp and convoy security, work site guard, and communication with the Embassy.⁸⁵

Fortunately the U.S. wanted to show support for the Jamaican government in the eyes of the Jamaican people because there were a number of social events that certainly conveyed that impression. Base camp tours and daily social visits were common between the U.S. crew and local businessmen and government officials. Eight task force soldiers attended a Jamaican culture night sponsored by the Hanover Police Force. Soldiers attended the anniversary dance and fund raiser conducted by the Hanover Womens Sports Club. There were two community/parish parties sponsored by the local government where personal gifts were exchanged. The unit initiated a sister city monument between Lucea and the unit's home town of Okmulgee, Oklahoma. Such events generate goodwill and improve relations as long as the government is viewed as legitimate by the people -- which it was.⁸⁶

The unit made a number of charitable donations such as books to various schools and 500 pounds of used clothing to the Salvation Army and United Methodist Church. There were also frequent press interviews with the Jamaica Record, Daily Gleaner, and the Western Mirror. The project's 5207 manhours of construction seems a minor effort toward assisting a nation, but it was a highly effective and inexpensive means to enhance goodwill.⁸⁷

OTHER ASSORTED PROJECTS

The Army engineers have been active in minor nation assistance projects all over the world -- usually in underdeveloped and remote locations. The 362nd Combat Support Equipment Company, for example, constructed a medium lift, C-130 forward landing strip at Bargoni, Kenya from September 1989 through November 1989.⁸⁸ Elements of the 416th Engineer Command deployed to Azrak, Jordan to assist host nation personnel with 9.8 kilometers of road and a cobra gunship range.⁸⁹ A year later, teams from the 878th Combat Heavy Battalion (Georgia National Guard), 926th Combat Heavy Battalion (Alabama National Guard), and the 92nd Combat Heavy Battalion (Active Duty, Ft Stewart) returned to Jordan to construct 13.7 kilometers of road with 17 reinforced culverts. The engineering challenges included lime stabilization for the clay-silt soil and water supply for compaction.⁹⁰

An engineer team from B company, 84th Engineer Battalion recently finished a 45 day project in Bangladesh where they worked side-by-side with a platoon of Bangladesh Army engineers to build three schools. Materials, money, and equipment were all scarce. The local material of choice was brick but the quality was so poor that the buildings would not have withstood the monsoon season. Wood was prohibitively expensive so the final solution was concrete for the structural members. The team crushed the Bangladesh brick to use as it aggregate for the concrete.⁹¹

The project took place during the religious holiday of Ramadan so the Muslim soldiers in the Bangladesh platoon did not eat a meal or even drink water during the day. Since daily temperatures rose above 100 degrees Fahrenheit, their productivity was affected. The soldiers employed crude but innovative construction techniques to provide the town of Mirpur with three new schools and learned a great deal about construction in a tropical environment.⁹²

CONCLUSION

The preponderance of effort in nation assistance over the last ten years has been in Latin America where Army engineers have completed projects in Costa Rica, Honduras, Guatemala, Belize, Bolivia, Peru, Ecuador, and Panama. To a lesser extent, engineer units have participated in nation assistance in the Middle East, Africa, and the South Pacific. Due to the positive results on these projects, the current trend in the Army and engineer community is to expand and develop doctrine for the nation assistance role of Army engineers. The next step is to use the lessons learned from these projects to assess when combat heavy battalions can be most effectively used for nation assistance.

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CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

Combat heavy engineer battalions have demonstrated the ability to play a major role in nation assistance. Still there are limits and constraints concerning how combat heavy battalions can best be employed. Previous chapters have examined the concept of nation assistance, the structure of the combat heavy engineer battalion, and a series of previous nation assistance projects. This chapter synthesizes the information in the previous chapters and searches for some consistent themes. The final result is a set of guidelines which planners should consider before using combat heavy engineer battalions on nation assistance projects.

The guidelines are based on the lessons learned from previous projects and the desirability, acceptability, and feasibility criteria discussed in previous chapters. A project is desirable if it meets the objectives of the relevant nation assistance concept: helping people helping themselves, counterinsurgency, or furthering the interests of both countries. Other aspects of desirability that apply regardless of a specific nation assistance concept should be considered such as training benefits and goodwill. A project is acceptable if the U.S. realizes the potential pitfalls and is willing to take the risks associated with the project. A project is feasible if it is within the capabilities of the combat heavy engineer

battalion to successfully complete the project. The desirability, acceptability, and feasibility criteria appear to be good assessment considerations and elements of each of them appear in the proposed guidelines.

These guidelines are ideals. Any project that meets them all should be assigned to a combat heavy battalion. Any project which meets none of them should not be assigned. Unfortunately, these guidelines will inevitably conflict and military planners will have to assess the tradeoffs. The priority and relative importance of each guideline will vary with the situation. The list is intended as a starting point to help the strategic planner at least ask the right questions.

Finally, having researched a number of individual case studies, several problems and difficulties were consistent in all of them. Likewise, in the course of the research, several noteworthy points concerning the engineer battalions and nation assistance came to mind. This chapter concludes with a series of recommendations for using engineers on nation assistance projects in the future.

GUIDELINES FOR THE EMPLOYMENT OF COMBAT HEAVY ENGINEER BATTALIONS IN NATION ASSISTANCE

1. The combat heavy battalions are best suited to complete a particular project themselves. If the primary goal of a nation assistance project is to train host nation citizens to help themselves, then choose some other means.

There is no consistent purpose to U.S. nation assistance efforts. The 84th Engineer Battalion's project in Bangladesh appeared to be a purely humanitarian effort with no U.S. ulterior motives. The AHUAS TARA 89 goals appeared to be a combination of counterinsurgency and infrastructure development in the SOUTHCOM theatre. Fuerzas Unidas 89 seemed to be directed at improving relations with Bolivia and establishing the basis for future drug interdiction efforts. The projects in Saudi Arabia were designed for the mutual advantage of improving the defense posture of both countries in a hostile area of the world.

There is not necessarily a need to have a consistent purpose in nation assistance throughout the world. The U.S. relationship and interests are different with respect to each individual country. It makes sense to tailor U.S. nation assistance goals and objectives to the individual situation. If the U.S. objective in a region is to help an

individual country help themselves and become self-sufficient, then the combat heavy battalions are not the best choice.

Due to the inexperience of the soldiers, the low ratio of supervisors to enlisted soldiers, and the frequent rotation of personnel, combat heavy battalions are better suited for completing a construction project themselves rather than training and supervising another force. A Mobile Training Team is preferable for specifically training the host nation citizens. Careful thought should be given before taking personnel for a MTT from the combat heavy battalion. While the MTT performs a valuable service as demonstrated in the civic action effort on Panape, it deprives the rest of the unit of valuable leaders who are already in short supply.

The combat heavy battalions can provide some training when *working side by side with the host nation personnel*. The AHUAS TARA 89 task force in Honduras, Task Force Rock Eagle in Belize, and the 84th Engineer Battalion in Bangladesh trained small numbers of the host nation military by incorporating them into the work force. Language skills, different customs, and unfamiliar construction techniques are easier to overcome when people are working together towards the same goal. Still the U.S. engineers were doing the work rather than supervising others. Combat heavy battalions are best suited to do the work themselves and should be employed in that role.

2. The project must be within the capability of the unit's skills and equipment. The project is more desirable if Army Functional Component System facilities can be used. The U.S. must not promise the host nation any more than can realistically be provided.

The combat heavy battalions are best employed for roads, bridges, airfields, and single story buildings in an underdeveloped environment. The USACE projects in Saudi Arabia were clearly too big and too complex for combat heavy battalions. The other projects such as the bridge over the Rio Utasi in Costa Rica, the Potos airfield in Bolivia, and AFCS structures in Honduras were ideal projects for combat heavy battalions. The type of construction and the undeveloped environment required soldiers to perform the same tasks under the same conditions they might encounter during wartime.

The AFCS structures save design effort, ease material procurement problems, and were specifically created for construction by Army engineers. The Army will rely on AFCS in the wartime development of a theatre and soldiers gain valuable training by using it. The structures are also designed to be simple and therefore easy for the host nation to maintain after the engineers leave.

Nation assistance projects are a relatively inexpensive means to generate goodwill. The goodwill can be lost if the Army

engineers do not complete what they promised or provide a facility that crumbles within months after being built. It is easier to promise less and produce a realistic construction schedule during the planning phase than to try to make up for undue optimism later. The Dirkou Airfield would have been easier and more positive if the U.S. had not unrealistically raised the expectations of the Niger government. One critical solution is to include the construction unit on the initial site survey. Optimistic projections are easy for people who do not have to complete the project.

The skills, capabilities, organization, equipment, and limitations of the combat heavy battalion should be well understood. There are numerous projects for which they are well suited. Historical examples are readily available which makes assessment for future projects easier. The combat engineer battalions have demonstrated ingenuity, perseverance, and even an overwillingness to try anything. Planners need to understand their limitations as well.

3. Combat heavy battalions should be the best available alternative for the project. The combat heavy engineers should not be competing with civilian contractors nor denying potential employment to the citizens of the host nation.

The USACE projects in Saudi Arabia are an example where civilian contractors would have been denied employment if combat heavy engineer battalions were used. Saudi Arabia is wealthy enough to hire civilian contractors. Other countries are much poorer and have more projects to complete than they have money available. Some projects are in such remote or hazardous environments that other sources are unwilling to do the work. Before sending the Army engineers, the U.S. should analyze whether the work could be performed better by the host nation with the loan of material or equipment. An analysis similar to the one conducted with respect to Peru should be made prior to using combat heavy battalions. Once other sources are examined, combat heavy battalions may still be the best choice.

4. There must be sufficient time allowed for the combat heavy battalion to plan the project.

Prior to the start of construction, any project will require a site survey, design of plans and specifications, authorization of funds, coordination of support, transportation of equipment, procurement and acquisition of materials, and deployment of personnel. All of this takes time and cutting corners in the planning process can lead to disaster on the project site. Problems that are not foreseen and solved prior to the start of construction are more

expensive and harder to explain when people and equipment are idle on the job site.

Design changes, late deliveries, improper surveys, and equipment breakdowns will be prevalent on any job site -- especially in a remote environment over long lines of communication. Detailed planning will alleviate some of these. The frustration at Dirkou contrasted with the early completion by Task Force Rock Eagle in Belize can be largely attributed to prior planning. On the Dirkou Airfield project, the first Mobile Training Team members did not even know each other and the site survey was completed in a matter of hours by people who never had to do the project. There was no unity of command. The scheduled project completion date had already passed by the time command, support, and liaison relationships were firmly established.

In Belize, the unit had nine months to plan and the Belize Ministry of Works had all of the materials on hand. The chain of command and the delineation of responsibility were established early. Task Force Rock Eagle still encountered problems which required innovative solutions but they were not insurmountable.

5. A large support structure must be available to support and accompany the combat heavy battalion.

The combat heavy battalion is not self-sustaining. It has limited organic maintenance and mess capability but cannot be

deployed to a remote environment by itself for a several month construction project without support. Necessary support which may comprise over half of the deploying force will have to include transportation, medical, communication, psychological operations, public affairs, legal, finance, higher level maintenance, supply, and contracting personnel.

Every project from Panape to Peru required large logistical support. It is obvious that food and repair parts are needed but it is easy to overlook equally essential support such as contracting and public affairs personnel. Fuerzas Unidas 89 in Bolivia reaped the benefits of a well coordinated media campaign that presented the project to the world in the best possible light. Since one of the intended effects of nation assistance is improved relations and goodwill, the success or failure of a project may rest with how the media portrays the project. The Abriendo Rutas effort in Ecuador suffered at times from adverse press coverage. The logistical support is at least as important to project success as the construction effort.

6. The country team and the regional CINC should agree that the project is in the best interest of the United States. They should agree on the project's desired goals, the potential pitfalls, and how the project fits into their regional strategy.

The United States interests and goals in nation assistance are different for every country. Since the State Department and Defense Department are actively involved and have a stake in nation assistance, it is imperative that they coordinate their effort. It is easy to undertake a series of hap-hazard projects that a host nation requests without examining how the project fits into U.S. goals and strategy for a region. The constructing unit should even be briefed on what role their project plays in the national strategy.

The chance for misunderstanding is diminished if the country team and regional CINC agree on a project's intent. Nation assistance carries potential pitfalls that coordination can prevent such as selecting projects that unintentionally threaten a host nation's neighbors or projects that *inadvertently make life easier* for the drug dealers the U.S. is trying to interdict. Nation assistance projects typically demonstrate U.S. support for an existing government. The previous projects have illustrated the types of social contacts that U.S. soldiers can make and government functions they attend. While the extent of interaction, for example, between the Oklahoma National Guard and the Jamaican government in Operation "No-Problem" added immeasurably to the project's success, it could have been disastrous if the Jamaican government was oppressive to its people. The U.S. had to reassess its nation assistance in Panama when relations with General Manuel Noreiga soured. Coordination between the military and the country team

helps avoid embarrassing incidents or unintended consequences in nation assistance efforts.

7. If the host nation has a military, it should be a military force that the United States supports. Otherwise, a combat heavy engineer battalion should not be used.

The U.S. Army engineers cooperated and worked with the host nation military in every project examined except for Camino de la Paz in Costa Rica which does not have a military. Even the small defense forces in Jamaica and Belize worked with the U.S. engineers either as co-workers, support personnel, or security forces. The Hondurans attached a platoon of engineers to each U.S. engineer company in the AHUAS TARA 89 exercise. Any host nation military would certainly resent not being included in a project completed by a foreign military in their own country. If the military of the host nation is an oppressive force that the United States does not want to openly support, some means for nation assistance other than combat heavy engineer battalions should be used.

8. If the U.S. has not been involved in nation assistance projects with the host nation before, the first effort should be minor in scope to allow any problems to surface on a small scale.

The Dirkou Airfield was the first nation assistance project in Africa and was a large effort. As a result, the problems that surfaced were unforeseen and had severe consequences such as the rock crusher breaking down, unsuitable aggregate, lack of coordination on supply and maintenance, and inadequate command and control. A smaller project would have experienced the same problems but they could have been resolved on a smaller scale before attempting a large project.

Construction in Peru started with a squad-sized exercise named Fuerzas Unidas 87. If the U.S. ever pursues a larger project in that country, Army engineers can learn from the experience of this small project -- especially in establishing support mechanisms and liaison relationships. The entire SOUTHCOM nation assistance effort has been effective by starting with small projects and expanding the scope once the initial efforts succeeded. The number of bridges and roads that Army engineers completed on the Camino De La Paz exercises in Costa Rica has steadily increased each year.

9. The project duration should be short, preferably one to six months in length for any individual unit. A year should be the absolute maximum.

Most of the nation assistance efforts have required engineer soldiers to work long hours in harsh environments. These soldiers

leave their home station and their families to participate in these exercises. The support mechanisms are sparse, austere, and designed to be temporary in nature. Unit morale and effectiveness would deteriorate on a longer project. The soldiers in Fuerzas Unidas 89 in Bolivia worked 6-1/2 day weeks for 10 - 12 hours a day in altitudes over 10,000 feet. They were exhausted at the end of the project.

All of the projects examined were under a year in duration for any individual team -- usually three to six months. During Abriendo Rutas in Ecuador, the team found that two week tours were too short to be efficient or productive as National Guard and Reservists rotated through for their annual training. If a project is significant in scope, it should be divided into multi-year portions and split among different units. The Potos airfield being constructed in Bolivia on Fuerzas Unidas 89 is planned as separate projects extending over three years.

10. If the project is located in a hazardous environment, security support must be available from outside the unit -- preferably from the host nation.

If the project is located in a hazardous environment, the rationale for using combat heavy engineers increases. Since combat heavy engineers have received soldiers skills training, weapons qualification, and have the explicit secondary mission to fight as

infantry if necessary during a war, they are better suited for construction in a hostile environment than civilian construction workers. Their mission is construction in a wartime theatre of operations which is hazardous in nature. While combat heavy engineers are soldiers who have been trained to fight, it does not mean they should intentionally ever be put at risk unless a vital national interest is at stake. Since that is not the case in most nation assistance projects, combat heavy engineers should only be used if security is provided and their safety can be assured.

Using host nation forces for security has worked well on previous projects. A Bolivian infantry battalion provided convoy, work site, and base camp security for American forces on Fuerzas Unidas 89 when there were terrorist threats against the task force. The Honduran military guards during AHUAS TARA 89 were largely responsible for keeping theft to a minimum and preventing any international incidents between U.S. soldiers and local Hondurans. The host nation military understands the language, the culture, and the potential threat better than visiting U.S. soldiers. Using host nation military as security gives them a role in the project which enhances their credibility in the eyes of the local population.

11. The project should provide high quality training for the deploying unit. Ideally the project should involve the construction tasks that the unit would perform in time of war.

This is the easiest guideline to meet considering that the commanders in every after action report examined stated that, despite whatever problems were encountered, the nation assistance project was the best training their unit could receive. Working in a new and challenging environment, constructing buildings and roads that will serve a genuine need, building a support organization from scratch, operating over long lines of communication, establishing liaison with a host nation, learning local construction techniques, using unfamiliar materials, and physically deploying with tools and equipment to a remote area simply cannot be duplicated on any post in the United States. The nation assistance projects have been conducted in remote, undeveloped areas of the world. The United States, as an industrialized nation, does not have the genuine need in peacetime for the type of construction in which the combat heavy engineers specialize.

RECOMMENDATIONS

1. If the combat heavy engineers will have a larger role in nation assistance projects in the future, the Engineer School should reconsider current plans for moving more combat heavy units to the Reserves and placing Active Duty combat engineer battalions in support of the post Directorate of Engineer and Housing (DEH). Both plans would make nation assistance missions harder to conduct. It

is more difficult to mobilize Reserve units for extended duty in a foreign country than an Active Duty unit. If the Active Duty unit supports the DEH, the post depends on that combat heavy battalion for operations and maintenance which makes it harder for the unit to deploy.

2. Three consistent problems were echoed loud and clear in every unit after-action report examined:

a. U.S. engineer units currently lack the training and equipment to conduct an effective rock crushing operation. The Army equipment is old and unservicable. The only successful rock crushing operations were conducted on leased equipment and only after soldiers took time to learn the operation. Since most road projects require crushed aggregate, the Engineer School should consider adding rock crushers and trained operators to selected combat heavy battalions. The Engineer School should increase the Program of Instruction (POI) in the Officer Advanced Course, Officer Basic Course, and NCO Advanced Course to include more hours on quarry operations.

b. Better and more water distribution capability was needed for compaction on all of the road projects. The Engineer School should investigate and recommend solutions.

c. A full time contracting officer is essential for nation assistance projects and needs to be appointed early in the planning process given the long lead time for material procurement. Some of the projects studied brought materials from the U.S. while others purchased them locally. Both methods posed unique challenges. Material delays are the most common source of troop construction interruptions. Every project should have a contracting officer who speaks both English and the language of the host nation, has construction experience, and is positioned in the chain of command to have the same sense of urgency as the officer in charge of the project.

3. Both Fort Leavenworth and the Engineer School are producing doctrinal manuals for nation assistance. Both manuals address nation assistance as it fits into counterinsurgency for low intensity conflict. Now that Army engineer units have successfully completed numerous nation assistance projects and most of the units have written after action reports citing their lessons learned, the Engineer School should consolidate these reports and produce a "nuts and bolts" document on how to conduct nation assistance projects. The Engineer School Directorate of Evaluation and Standardization has collected many of these reports and is already consolidating the lessons learned. A comprehensive document that helps engineers

avoid the pitfalls of their predecessors on future nation assistance projects would be invaluable.

4. Further study should be conducted to determine under what conditions it is more advantageous to lease construction equipment from a host nation rather than requiring a unit to deploy with its own equipment. The results from the case studies in this paper were inconclusive. Each option presented challenges. The same dilemma appeared when deciding to deploy with construction materials from the United States or to purchase them locally from the host nation. While each option has associated costs and benefits, it would be practical to have a checklist or a set of guidelines for a planner to use that at least outlines the relevant considerations.

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MacDill AFB, FL 33608
40. Commander
Western Command
ATTN: Engineer
Fort Shafter, HI 96858
41. Commander
European Command
ATTN: Engineer
APO NY 09154

- 42. Office, Chief Army Reserve
HQDA (DAAR-ZA)
The Pentagon
Washington D.C. 20310
- 43. Commander
411th Engineer Brigade
Brooklyn, NY 11234
- 44. Commander
412th Engineer Command
P.O. Box 55
Vicksburg, MS 39180
- 45. Commander
416th Engineer Command
4454 W. Cermak Rd.
Chicago, IL 60623
- 46. Commander
420th Engineer Brigade
511 Carson St.
Bryan, TX 77801
- 47. Commander
16th Engineer Brigade
2825 W. Granville Rd.
Worthington, OH 42335
- 48. Commander
30th Engineer Brigade
Wilmont & Terminal Rds.
Charlotte, NC 28219
- 49. Commander
35th Engineer Brigade
1717 Industrial Dr.
Jefferson City, MO 65101

- 50. Commander
194th Engineer Brigade
3041 Sidco Dr.
Nashville, TN 37204
- 51. LTC G. E. Billick
Department of Joint & Combined Operations
Command and General Staff College
Fort Leavenworth, KS 66027
- 52. COL Catherine H. T. Foster
8760 Chestnut Circle
Kansas City, MO 64131